

STATE LIBRARY OF PENNSYLVANIA




3 0144 00049012 8

S-R  
Q

608  
In85  
v.15





Digitized by the Internet Archive  
in 2017 with funding from

This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

*THE Inventive Age* AND  
*PATENT INDEX.*

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR.  
No. 1.

WASHINGTON, D. C.—JANUARY, 1903.

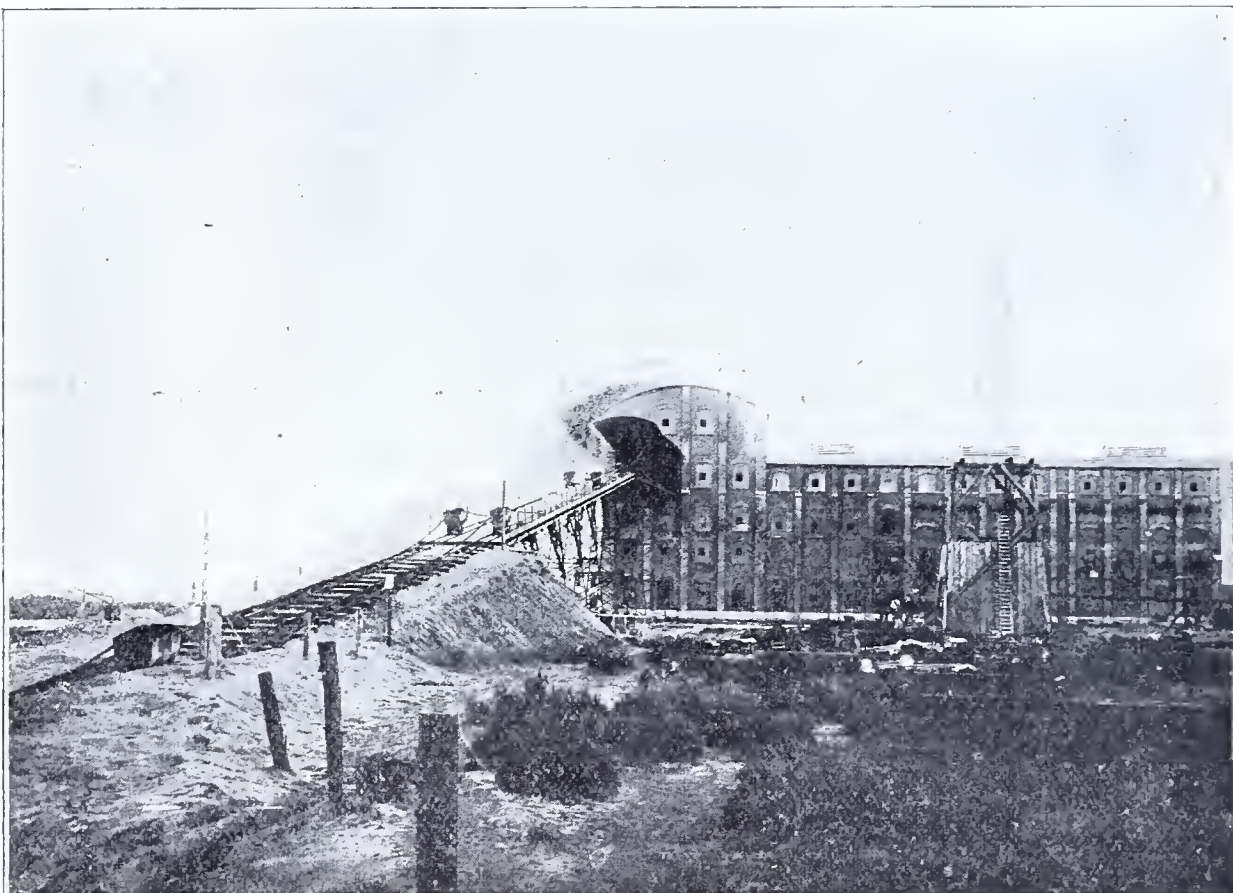
SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

### MACHINE FOR MAKING BRIQUETTES.

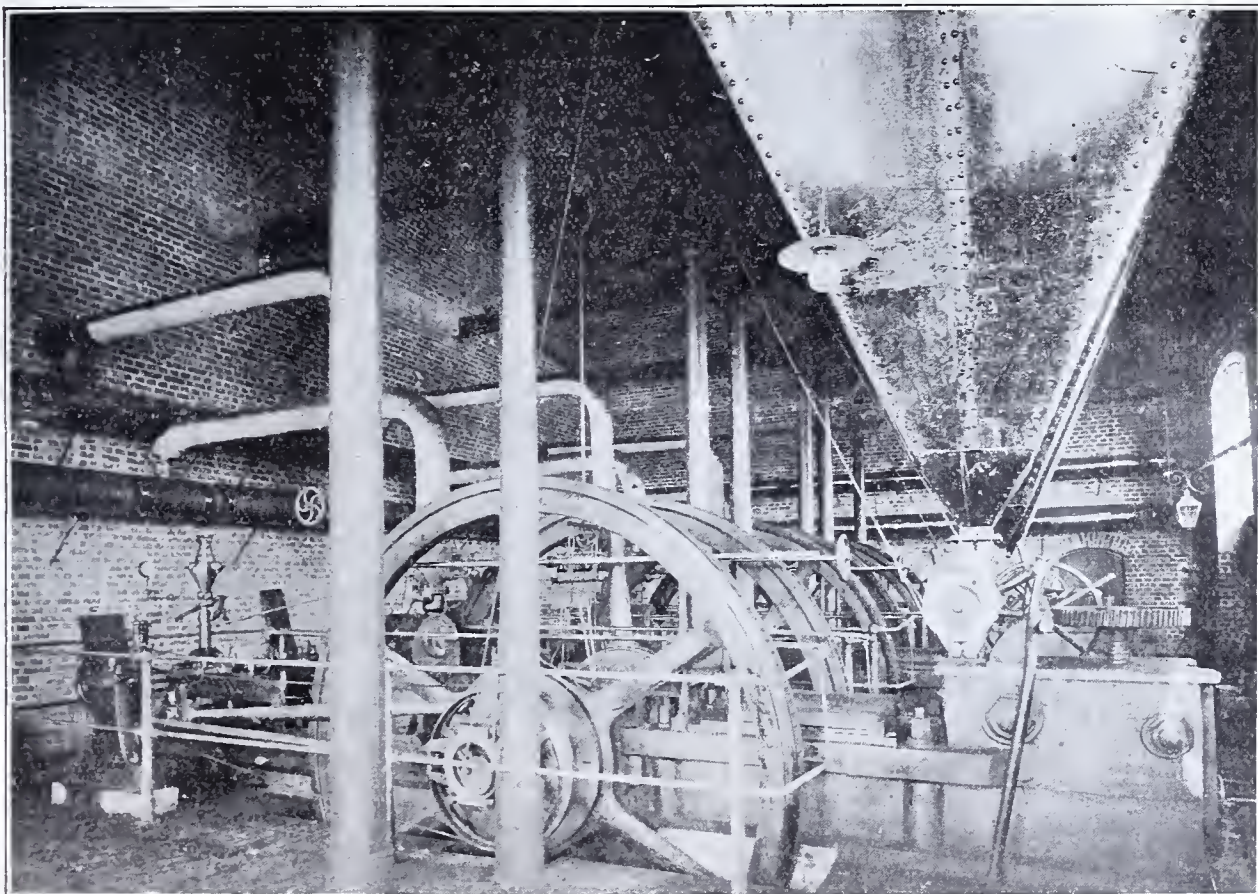
IN THE October AGE, in speaking of the fuel problem and its solution, we suggested that one way to solve it would be to make use of briquettes prepared from coal dust, saw dust, peat and crude oil, which are extensively made and sold throughout Europe, particularly Germany. Judging from reports which have come into the State Department from Consul General Mason, public interest in this question has been thoroughly aroused, this being evidenced to Mr. Mason by the correspondence which has been received by him during the last few months from nearly every State and Territory of the Union.

There are in New England, western New York, Michigan, Illinois, Wisconsin, Oregon, and Washington vast beds of peat, which have been thus far hardly explored. There are in the Dakotas and Gulf States, large deposits of lignite and material midway in character between lignite and peat: and there are in all the coal-mining States enormous quantities of bituminous dust and anthracite culm, all of which may, by the employment of modern machinery and processes, be added to the fuel supply of our country.

This is an industry in which the first tentative efforts made in the United States have generally failed, but which has been developed in Germany, France, and Belgium by long, careful, scientific experiments into an important and successful system of production. There is no reason why any American operator or mine owner should risk a dollar



THE PRINCIPAL PEAT-BRIQUETTE FACTORY IN GERMANY.



BROWN-COAL BRIQUETTE FACTORY, WITH THREE PRESSES OF HORIZONTAL TYPE.

in vague or hazardous experiments; he has only to ascertain by expert inquiry what his crude material contains—whether or not it is adapted to profitable conversion into briquettes, and, if so, by what processes and machinery it can be most effectively treated. With a view of simplifying to some extent the practical proposition, the following resume of the briquette manufacture, as it exists in Germany, is submitted.

German briquette factories are divided, in respect to the crude material employed, into two general groups—those which make household briquettes from brown coal (lignite) or carbonized peat: and those which produce the so-called “industrie briquettes,” using as basic material coal dust or “slack,” the waste of bituminous coal mines.

The first illustration shows the principal peat-briquette factory in Germany. It is located near Stettin, has been in operation several years, and is apparently successful.

Household briquettes, as made in Germany from brown coal, peat, and to a small extent from anthracite dust, are used for grates, heating stoves, cooking stoves, and ranges, and constitute the principal household fuel of Berlin and other German cities. They are clean to touch, kindle readily, burn with a clear, full flame, and are cheaper in Berlin, ton for ton, than anthracite or good bituminous coal. They are made—largely from brown coal—in factories located mainly in Silesia, Saxony, and the Rhine provinces, and united in a syndicate, which controls the output, regulates prices, and looks after the general welfare of the industry.

Machinery for the manufacture of briquettes from



lignite is made by several large establishments, among which may be cited the Zeitzer, Eisengiesserei, at Zeitz, in Saxony; the Maschinen Fabrik Buckau, at Magdeburg; and the Konigin Marienhutte, at Cainsdorf, in Saxony.

They are made of bituminous-coal dust, held together by a matrix of mineral pitch—that is, coal tar derived from retort coke ovens or gas manufacture, and from which the benzole and other valuable elements have been eliminated. Pitch of this quality

is such as to permit a low percentage of binder to be used, they are the cheapest and easiest kind of briquettes to produce. They are made in machine presses more or less similar to the one shown in the third illustration, which is a typical machine of the Zeitz pattern, with a capacity of 90 tons of briquettes per day.

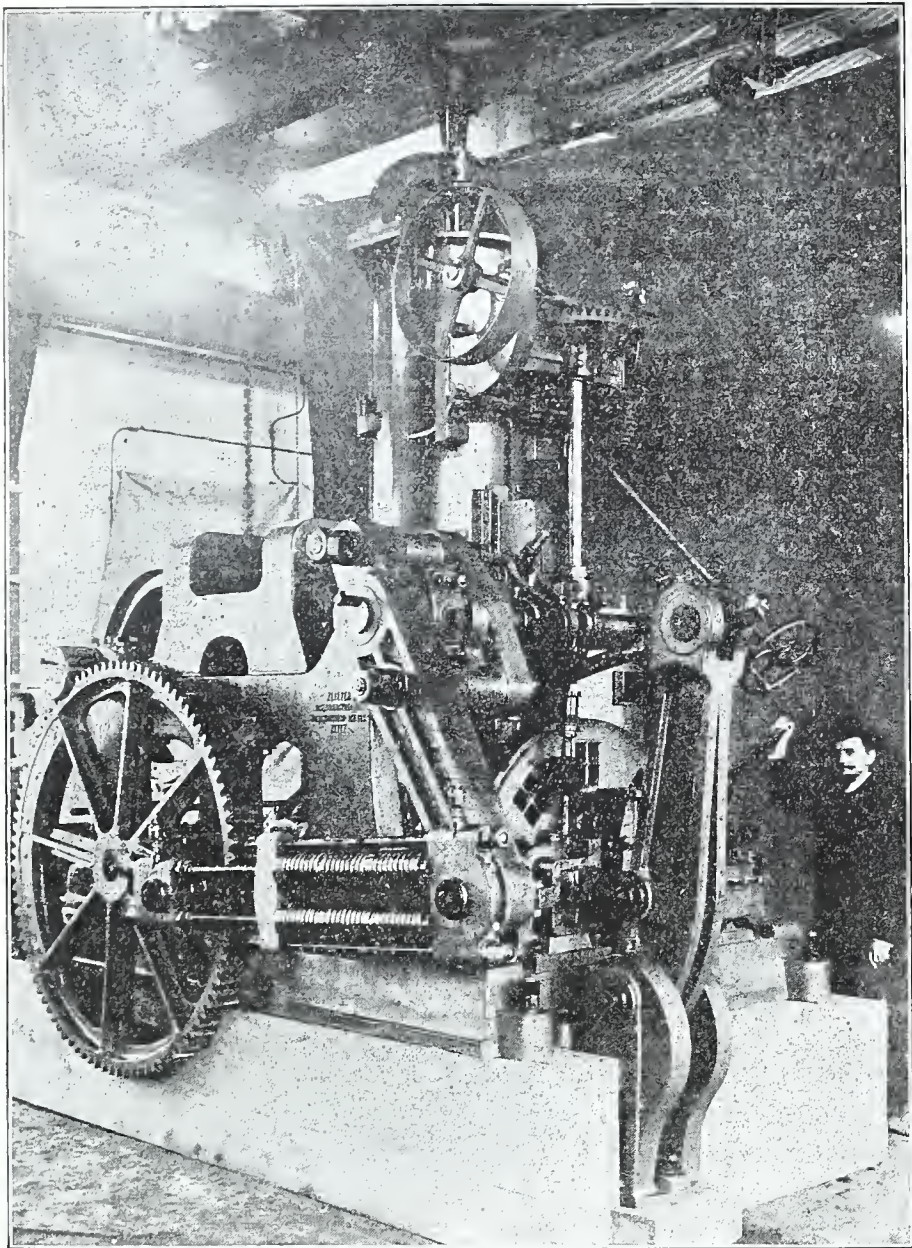
The output of soft-coal briquettes in western Germany is controlled by a syndicate called the Briquette Sale Syndicate of Dortmund, which includes among its members 31 factories, located in Westphalia and the Rhine provinces. These establishments employ, collectively, 112 machine presses of the Couffinal type, besides 1 French machine of the Bourriez model and 3 so-called "egg-rollers," or machines, which produce small, oval briquettes of egg size which are burned in certain kinds of tubular boilers. The syndicate claims a maximum annual capacity of 2,100,000 tons, and, as its official report shows, makes about three-fourths of that amount—whatever the market will take at prices which the syndicate managers consider equitable. Industrial briquettes are usually of a square or oblong form, convenient to be closely packed or built up into a wall, like bricks, whereby they greatly economize space as compared with raw coal. They range in weight from 3 to 10 pounds, and each bears the initials or trade-mark of the company by which it is produced, so that in case of any defect in quality, the inferior briquette can be readily traced to its source of production. When burned whole, they are consumed slowly and give out a steady, moderate heat for a long time. When it is desired to quicken or intensify the flame, they are broken up, and in this condition are especially adapted to flue or tubular boilers, sugar evaporating, smelting, and annealing furnaces, in glass manufacture, or in porcelain and cement factories; wherever, in fact, a fuel capable of producing a long, fierce flame is desirable. Their efficiency as locomotive fuel may be inferred from the fact that the State railways of Prussia, which used 130,000 tons of such fuel in 1889, have bought from the syndicate 680,000 tons during the first nine months of 1902.

agree that with an admixture of from 4 to 8 per cent of matrix, the manufacture of anthracite briquettes, which will bear transportation by sea or land in any climate, presents no technical difficulty.

The manufacture of coke and briquettes from peat or turf is still relatively in the experimental stage, although there are several factories in successful operation, and another—largest of all—is just being put into operation at Königsberg, on the Baltic Coast of East Prussia.

III. As a result of the present widespread interest in this subject, and the many inquiries that have been received from mine owners and operators for technical information as to processes, cost, and capacity of machinery, etc., a combination has been formed between three of the foremost machine builders in Germany, whose products collectively include all the necessary apparatus for making briquettes from coal dust, brown coal, and peat. The purpose of this syndicate is to meet promptly and efficiently the American demand for machinery and working methods which represent the best results obtained by scientific study and mature experience in Germany. The combination is entitled "The Export Syndicate of Briquette Machinery Manufacturers," with central office at No. 59 Friedrich Strasse, Berlin, and includes as members the Zeitzer Eisengiesserei at Zeitz, Saxony, the Maschinenfabrik Buckau at Magdeburg, and the Maschinenfabrik (formerly Jaeger) at Ehrenfeld-Cologne. Its plan is to send over, within a few weeks, an experienced engineer, who will establish an office at New York and be prepared to confer with firms and persons who contemplate entering upon the manufacture of briquettes, to examine sites and materials, make plans and estimates for buildings, machinery, etc. An opportunity will be thus offered for American mine owners and operators to ascertain definitely in advance the theoretic value of their materials for briquette making, and the cost of a plant of a given daily capacity.

Meanwhile, the same results can be reached with important saving of time if owners of coal mines or lignite beds will send to the above address,



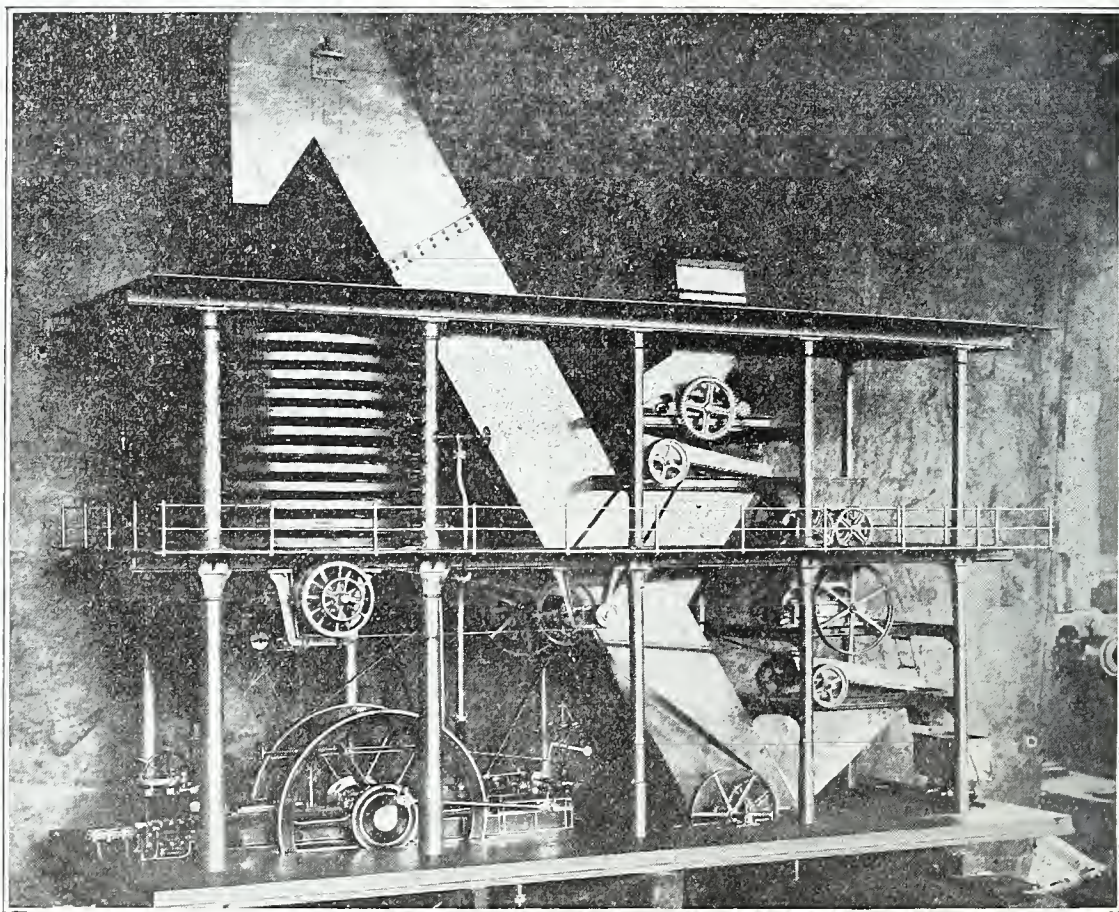
MACHINE PRESS FOR SOFT-COAL BRIQUETTES (90 TONS PER DAY.)

The fourth illustration shows a miniature working model of a brown-coal briquette factory, which was exhibited by the Zeitz establishment at the recent exposition in Düsseldorf. It exhibits in condensed form the essential elements of such a plant—the machinery for pulverizing, elevating, drying, and finally compressing the material into briquettes.

There are in Germany 439 brown-coal mines, which produced last year 44,211,902 tons of lignite, valued at \$46,042,500, or a little more than \$1 per ton. Of this whole number of mines, 181 have each from one to six briquette factories, in each of which from one to ten presses are employed. The whole brown-coal-briquette industry of Germany includes 286 factories, with a total of 691 presses. Statistics of the total yearly product are not accessible, but from the fact that a single press turns out from 50 to 90 tons per day, it will be readily inferred that the annual output is enormous. They are the standard household fuel throughout a large portion of Germany, and are besides largely used for firing steam boilers, especially in cities where their cleanliness and freedom from smoke and dust are highly esteemed. The standard household briquette is about 8 inches in length by 4 inches in width and 2 inches thick, and is retailed and delivered in Berlin at prices ranging from \$2 per 1,000 in summer to \$2.50 in winter.

II. Industrial briquettes are used in Germany for firing locomotives and other steam boilers, for smelting in reverberatory furnaces, and for many other kinds of industrial heating.

costs in Germany from \$10 to \$12 per metric ton. The percentage of matrix necessary to be used varies greatly with the "fatness"—i. e., richness in bituminous elements of the coal itself. Slack from very fat coal will work into briquettes with an addition of 2 or 3 per cent of pitch, while leaner grades may require 6 to 8 or even 10 per cent, the latter proportion being sufficient, at the present cost of pitch, to render such coal unprofitable for briquette-making purposes. Briquettes made from bituminous slack, although not smokeless, are much more nearly so than ordinary bituminous coal. When burned in locomotives or any well-constructed boiler or other furnace with a good draft, they create only a thin, translucent mist, which contains relatively little soot, and is very different from the inky clouds that roll up from most factory chimneys where soft coal is shoveled indiscriminately into the furnaces. The one notable defect of such briquettes is that the mineral pitch, which is used as a binder, contains more or less creosote. This renders dust and fumes from such fuel acrid and sometimes irritating to the skin when confined in a close, hot boiler room. Soft-coal briquettes are made from the dust and waste of mines, and, when the composition of the coal



WORKING MODEL OF BROWN-COAL (LIGNITE) BRIQUETTE FACTORY.

Anthracite coal is so sparingly produced in Germany that the use of hard coal dust for briquette making is relatively unimportant. Experts, however,

directly, or through the U. S. Consul General, Berlin, 10 pound samples of their material in the exact condition in which it will be available in large



quantities for practical use. The percentage of water in any briquette material is an important factor in determining how it can best be worked.

If the material is dry—as, for instance, slack from a well-drained bituminous-coal mine—the sample may be sent in an ordinary box or package. If, on the other hand, the slack or culm is obtained wet from a washing process, or if the material is lignite or peat from a bog, the sample should be sent in a tight tin case, which will preserve the exact percentage of moisture which will be encountered when it is mined for use on an industrial scale.

The postal package treaty between the United States and Germany provides for the transmission by post, reciprocally, of packages not exceeding 11 pounds avoirdupois in weight at a uniform rate of 12 cents per pound. Allowing for the weight of the necessary covering, this will enable interested persons in America to forward to Berlin samples of their material sufficient in quantity to be analyzed, submitted to various tests and even made experimentally into briquettes; so that its adaptability to briquette manufacture, the percentage of binder required, the calorific value of the product, and methods and machinery best adapted to working it, can be ascertained and reported on in advance, by responsible experts who are prepared to follow up their estimates by practical operations.

In this way, the technical experience and scientific knowledge which have made the briquette industry successful and important in Germany, will be made directly available by American operators, who desire to begin at the point of economic efficiency that has been attained by the best practice in Europe.

### SOLID OIL BRIQUETTES.

There is probability of a new enterprise being launched in Los Angeles, Cal., which promises to play an important part in the fuel market.

Local capitalists are said to have become interested in a process, discovered recently by E. Osborn, by which crude oil can be converted into a solid. Numerous tests have been made, both with California and Texas oils, and it has been demonstrated that the idea is practical.

The advantage of the solid over the liquid oil is found chiefly in the fact that it is easier to handle, it being possible to burn in an ordinary furnace, the same as coal. It is also credited with containing more heat units than the liquid.

A company has been formed in Chicago for the purpose of erecting a plant in that city to manufacture "solid oil bricks." This company, known as the Compressed Oil & Briquette Co., has contracted for a large quantity of Beaumont oil, and as soon as a site has been selected will begin the erection of a plant capable of handling several thousand barrels of oil a month.

It was first intended to erect the plant in or near the Beaumont field, and ship the finished product to the consumers; but investigation showed that it would be a more advisable plan to ship the liquid, and this is the plan decided upon.

Los Angeles fuel consumers have become interested in the new process and are laying plans to get in the field if the Eastern venture proves a success. There is a large market in California and elsewhere for a fuel of this character, and it would be welcomed by many if found satisfactory.

The nearest product to the "solid oil brick" was turned out by the Tesla Briquette Coal Co. of Stockton, Cal. Before its plant burned down, the company had all it could do to keep the demand supplied with these briquettes, which were a combination of soft coal and asphaltum. They were used in coal stoves and were found very satisfactory.—*Pacific Coast Investor*.

## GUILLOTT SYSTEM OF RAILROAD LIGHTING AND VENTILATION.

OF late years when considering the subject of lighting and heating, the paramount issue has been that of safety. Through ignition and explosion, both oil and gas have caused large loss of life and destruction of rolling stock, due to which fact alone the railroads of Germany have been ordered by the authorities of that country to discontinue on all trains the use of the Pintsch lighting system.

A novel idea in lighting trains by electricity is the "Guillott" system which has been experimented with successfully on an important road, and is now to be applied to an express train. The motion of the train is used to generate the electricity. It is furnished by a rotary fan attached to the front end of the locomotive, as shown in the illustrations.

The fan is located close to the boiler head and presents a moving and cutting surface to the air pressure, causing the air to travel to the outer end of the fan blades and thence discharged at the fan's circumference. No air pressure is massed on the flat surface of the boiler head, but the curved surfaces of the fan blades utilize the traveling air pressure and thereby generate power. The fan cutting through the air revolves swiftly and does not add to the resistance of the air, nor retard the speed of train. This was demonstrated by repeated test runs, where the coal and water were accurately weighed, both with and without this system in operation. No gale of wind is required to cause the fan to operate;

The entire cost or expense of this system is confined to its initial installation, including when complete, one fan, one dynamo, and one storage battery with the necessary wiring and lamps. It operates and generates electricity for light and power at absolutely no expense. Electric light and ventilation combined can be furnished for less than the lowest cost of the Pintsch lighting system, and yet leave 50 per cent net profit. No engineer or attendant is required, and no attention other than regular inspection and oiling. The system incorporates the use on its lamps of specially designed globes, producing an illumination 50 per cent greater than any other railroad electric light, and 100 per cent in excess of the Pintsch light.

Recent tests on a train running 45 miles per hour resulted in the development of 4.5 KW. per hour, which amount of energy is sufficient to charge the storage battery, so that it will illuminate a train of five cars and leave the battery with nearly its maximum charge, due to the continuous operation of fan. By way of illustration: If 4.5 KW. are generated per hour during a nominal run of 10 hours, it will give a charge in storage battery of 45 KW. hours. The average train having five cars requiring illumination 6 hours per night will use about 27 KW. hours, thus leaving a surplus in battery of 18 KW. hours, plus a continuous feed of 4.5 KW. per hour during the time the train is running. Therefore, after furnishing all neces-

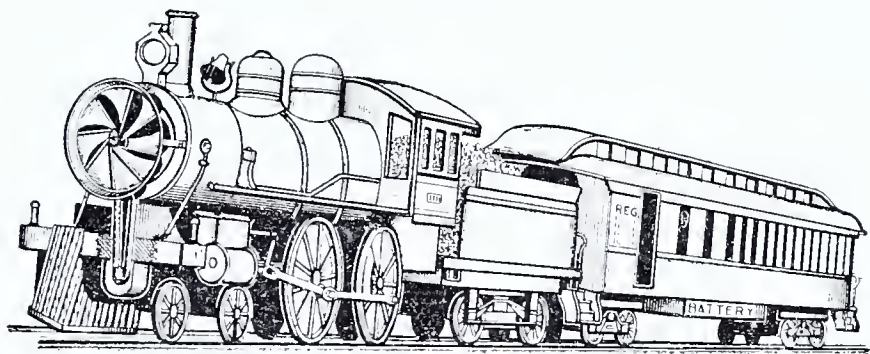


PLATE 1.

the ordinary pressure of the train moves it sufficiently to generate the electrical energy required to light any train, and leave a large surplus for ventilating fans and other purposes. The apparatus so located does not obstruct the view of the engineer, and can be applied to any size and style of locomotive and train without necessitating alterations on either engine or train.

The dynamo is located either on or under the pilot, and is directly connected to the fan by a special device. In plate 1, belt transmission is shown. A storage battery is located on the tender or underneath each car, and so equipped automatically with cut-outs as to properly govern the flow of current from dynamo to battery.

The fan being attached to the movable head of boiler, permits the latter to be swung open as usual for the purpose of cleaning the boiler.

sary light, the battery still retains the full charge of 4.5 KW. hours. A part of this surplus current may be used, in conjunction with exhaust fans, for the purpose of properly ventilating each car. On high speed trains, greater power and efficiency are obtainable.

The Western Electric Company have investigated this new system and pronounced it practicable and simple. Arrangements have been made with them for supplying the entire electrical apparatus for the equipment of trains. Mr. George D. Wilson, by whom the patents covering this system have been purchased, is the president and general manager of the Western Ventilating and Lighting Company of 232 South Clinton Street, Chicago, Illinois, a new corporation which has been formed to push the enterprise. Mr. Wilson is at present engaged in the equipment of a through train, includ-

ing the private car of the general manager, on one of the important railway systems having its terminal in Chicago. Upon application, Mr. Wil-

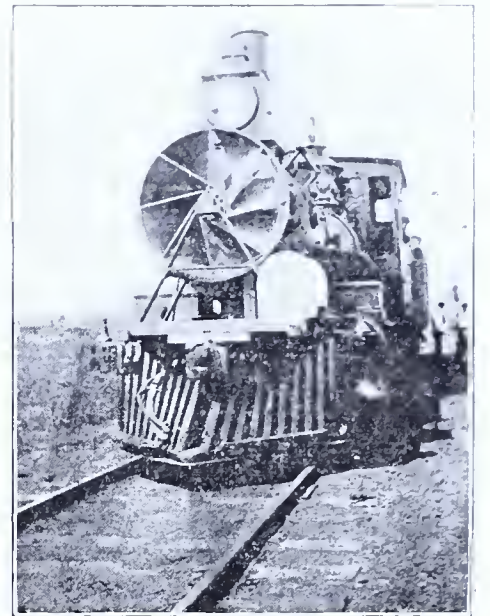


PLATE 11.

son will furnish estimates of cost of equipments, together with any other information concerning either the apparatus or his new organization.

### The Dudley Dynagraph Car.

There is a wonderful car making the rounds over all the great railways in the United States, Canada, and Mexico. It has nerves, flexible hands and delicate touch. In fact, it can do everything but talk. It takes on a bridal trip photography wedded to electricity, and finds recreation in taking pictures in one thousandth part of a second. It measures the elasticity of a rail when a hundred ton engine is rolling over it. It tests, measures and records everything of note connected with tracks, sleepers and road-beds.

It notes a slight deflection in a rail, which is not visible to the human eye, and announces its location and extent so that repairs can be made before the rails spread.

Many other useful feats are performed by this dynagraph car which speeds on its mission of mercy, and through the ounce of prevention annually saves many lives.

### New Fire Pump.

An experiment was made recently, at the Hotel de Ville, with a new fire pump invented by Mr. Robert Lefebvre, captain of the Rouen fire company. This pump is so small that only a very light two-wheeled cart with one horse is necessary to transport it. The dynamo is so constructed as to be run by a current from the street car or electric-light wires, and is brought into contact with them by means of a hooked pole or rod. The pump furnishes a pressure capable of throwing a jet of water, with a force equal to that of a steam pump, to the height of over 100 feet. It also has the advantage of being placed quickly in action wherever there is an electric current.

### Electric Ferryboats.

Why has not some one tried equipping an electric ferryboat? This would seem to be an ideal way of propelling those boats which make but short runs and lie at the slip for practically half the time. It would be a simple matter to arrange contacts for automatically charging when at the wharf, and it certainly seems probable that, in addition to the other conveniences, such boats would show a decided reduction in cost of operation.—*Electrical Review*.



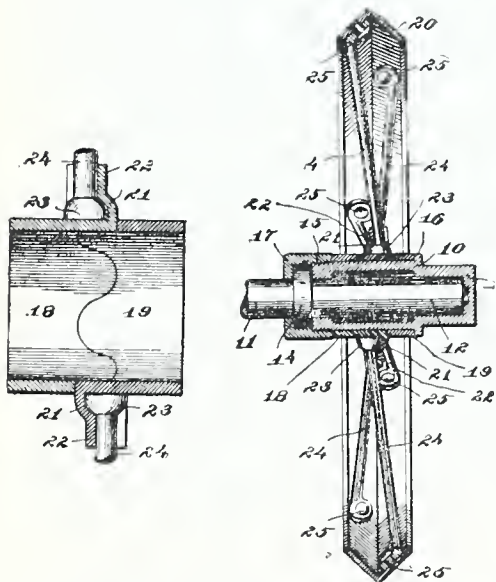
## CLEVER NEW PATENTS.

Wheel-Hub.—Scalper and Bolter.—Water-Gage Connection.—Eyeglasses or Spectacles.  
Nut Lock.

### Wheel-Hub.

Important improvements in vehicle wheels have been made by Mr. William T. M. Brunnemer, who resides in Bradley, Illinois.

One part of the invention relates to the hub and the devices for securing the spokes thereto. Heretofore it has been customary to secure the spokes to a hub by fastening the ends of the spokes non-removably thereto, either by casting them in by rivets or by fitting their ends into cylindrical pockets. In none of such constructions has it been possible to remove the spokes after they were once secured in place so as to insert others, and thus after a certain number of the spokes were damaged, the wheel was of no further use and had to be thrown away. The



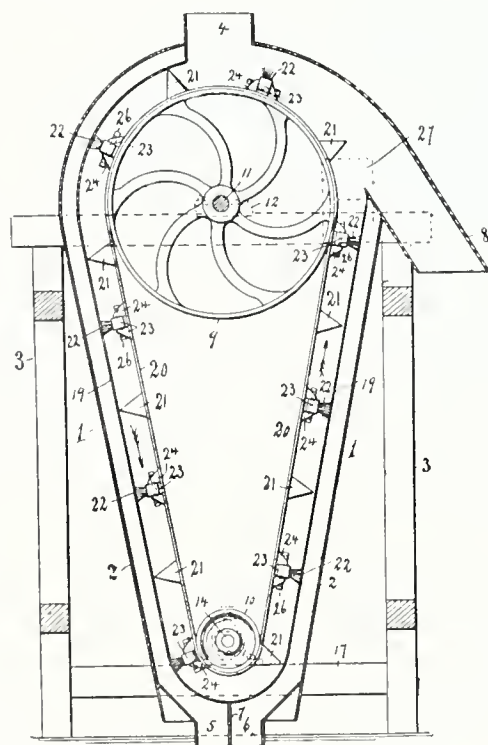
castings of hubs with cylindrical pockets, such as those above alluded to, is expensive and greatly increases the cost of wheels where such pockets are employed. In order to avoid the objections above noted, the inventor provides a wheel in which the hub has retaining devices for the spokes, which are so constructed that the spokes may be clamped in them and will be firmly held, said retaining devices, however, being so formed that the spokes may be released and removed when necessary and replaced by others. To this end the hub is provided with a sufficient number of spoke-sockets open at the side and provided with clamping ends, which may be pressed laterally around the spokes after they are inserted in the sockets to bind them firmly in place. In order to facilitate the manufacture of the hub, it is made in two sections adapted to fit together end to end to form the hub. Such sections are secured upon a suitable box, to which they are held rigidly, so that in effect they become a single piece. Each of the sections carries a number of spoke-sockets, usually one-half the sockets being carried by each hub-section, said sockets being placed equally distant apart around the peripheries of the sections, so that when the sections are united to form the hub, the sockets carried by one alternate with those carried by the other. In order to more securely unite the sections, their opposing ends are made

sinuous in outline so as to intermesh.

As regards the outer ends of the spokes, it has heretofore been customary to fit the ends of the spokes into suitable holes in the rim and then rivet them. This frequently results in the breakage of the ends of the spokes, thereby destroying the spokes and increasing the expense of manufacturing the wheel. To avoid this objection, the outer ends of the spokes are secured to the rim by separate rivets, which pass through the ends of the spokes and are secured in the rim, so that if a rivet breaks it may be replaced by another, the spoke being unaffected. A further feature of the invention relates to the construction of the hub-box and the mounting of the axle-spindle therein, so as to secure a dust-proof hub.

### Scalper and Bolter.

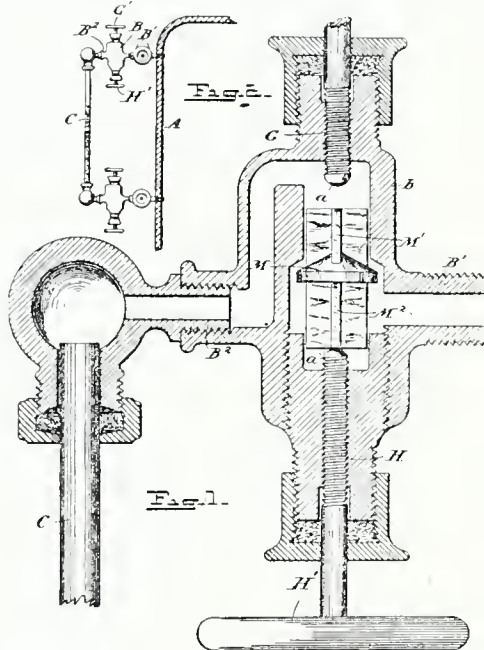
A very important improvement in milling machinery has been invented and patented by Mr. George R. Davidson, of Lenox, Michigan, the invention relating particularly to that class of machines known as scalpers and bolters. Mr. Davidson employs a tapering casing 1, supported within a suitable frame and having within the same a downwardly tapering screen 19. A large driving pulley 9, is arranged in the upper portion of the screen and small idler 10, is journaled in the lower portion thereof, an endless belt passing about both. On this belt are secured spaced triangular blocks 21, between which are fastened brushes 22, the latter being in engagement with the screen. The material is fed in through the top of the casing on to the belt, and is carried by the blocks and brushes around the same, the finer particles passing through the screen and discharging through outlets 5 and 6 made in the lower portion of the casing. The coarser material is ele-



vated on the opposite side by the blocks and brushes, and discharged through an offset outlet or chute 8. The brushes are adjustable upon the belt by suitable means, so that when they become worn from their contact with the screen they may be set out farther until they are completely worn out.

### Water-Gage Connection.

Mr. Joel B. L. McKenzie, of Rahway, New Jersey, has patented a new and important improvement in water-gage connections, the object being to provide self-acting valves at the ends of the gage, which, while normally open to allow sufficient flow of steam and water during the time the gage is working, will automatically close by the excessive pressure caused by the breaking of the glass gage tube. While this has been done before, it has not been accomplished in the practicable way invented by Mr. McKenzie, who provides means for guiding the valve and forcibly opening and closing the same when desired. The connection between the gage glass and the boiler is in the form of a valve

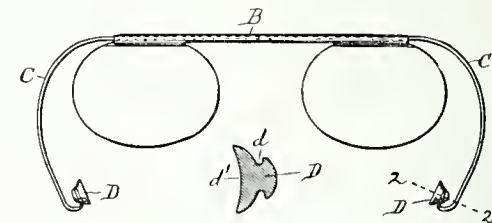


casing, within which is loosely guided a check valve that is open as long as the gage is in proper working condition. Should the glass break, however, the outrush of the steam will carry the valve to closed position, and thus cut off the escape. Threaded through the ends of the valve casing are screw-shanks having exterior hand-wheels. The inner ends of these shanks are arranged to be brought into engagement with the opposite ends of the valve, and thus the same may be positively moved to open or closed position as desired.

### Eyeglasses or Spectacles.

Mr. James E. Briggs, of Rochester, N. Y., has invented a distinctively new type of eye-glasses or spectacles, and the accompanying illustration will show what it is. It is what is known as "rimless" eye-glasses or spectacles, the lenses being without rims, having a portion of one edge of each firmly inserted into a slot of a tube B. Through the tube passes the bow, consisting of an elastic rod or wire C, that is bent around at the ends so as to be adapted to clasp the temples or sides of the head of the wearer, or even to be extended over the ears. When the bow or rod C is to hold the glasses by pressure on the temples, the ends of said bow are provided with loops, and within each loop is fastened a block D. (See the detail figure showing the block in enlarged section.) This block has a peripheral groove which receives the loop at the end of the wire or rod, and a concave face d'. The blocks are capable of rotation in

the loops, and the loose or rocking action of the blocks permits them to conform to the surface where the same is applied.



The blocks are preferably made, in a single pair of glasses, of different materials of opposite polarities, such as copper and zinc, upon one or both of which the fluids of or on the skin can act to produce an electrical current. Inasmuch as the rimless lenses rest upon the cheeks of the wearer, the tube B and the continuous wire C are insulated from the face of the wearer, except at the points where the blocks D press against the skin. Consequently, an electrical current is created which passes through the head of the wearer from one block D to the other.

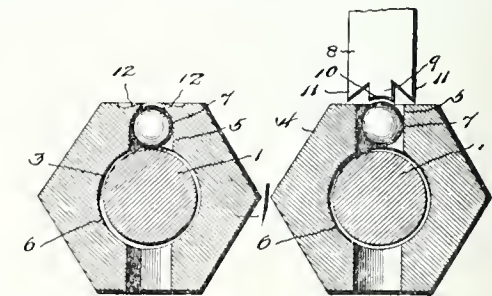
The patent is owned by the Briggs Optical Company, of Rochester, N. Y., of which the inventor is the President.

### Nut Lock.

One of the most prolific subjects of invention is the class of nut locks. Several thousand patents have been issued in this class, and yet there are few patents which embody the essential features of a practical nut lock.

The accompanying illustrations show sectional views of a nut lock devised by William E. Karns, of Parker's Landing, Pa., an inventor of considerable experience in various lines.

The figure to the right represents a sectional view of a nut and bolt, the nut having a transverse hole for the reception of a ball which forms a locking key. The design of the invention is to force the ball against the threads of the bolt, and also to turn over or swage the outer end of the hole formed in the nut, so as to hold the ball to its work. This operation is performed by means of a swage marked 8, which has



a curved seat portion 10 fitting the ball, and angular swaging lips 11, adapted to engage the surface of the nut at opposite edges of the outer end of the hole in the nut. When the swage is struck a sharp blow, it performs the dual function of forcing the ball against and into the threads of the bolt, also upsetting the holding swages 12, which retain the ball in place.

The figure to the left shows the swages 12, bent over, constricting the outer end of the opening 5, in the nut and holding the ball from movement.

It is obvious that by the employment of a lock of this character, it is practically impossible for the nut to turn. The invention is very simple and should meet with general favor.



## THE UTILIZATION OF WASTES AND BY-PRODUCTS IN MANUFACTURES.

WITH SPECIAL REFERENCE TO THE DECADE OF 1890-1900.

By HENRY G. KITTREDGE, of the Census Bureau.

### PART V.

#### SLAUGHTERHOUSE PRODUCTS.

Slaughterhouses furnish a multitude of by-products which are utilized on a commercial scale of some importance. The products of the gray brain matter of calves are now employed in the treatment of affections of the nervous system, known under different names, as, for example, neurasthenia (nervous debility; nervous exhaustion), agoraphobia (a dread of crossing open spaces, city parks, etc.), chorea (nervous disease; St. Vitus' dance), psychosis (mental disorder; insanity).

It was not until 1870 that the preservation of pork and beef products was practically carried further than the air-drying and salt-pickle curing of hams, bacon, mess pork, and dried and corned beef. The customary practice at that time of shipping the cattle from the West to the Eastern markets, to be there slaughtered, entailed a heavy shrinkage in weight, and other losses. It was about this time that there was a commercial demand from glue manufacturers for a part of the slaughtered offal, the disposition of which had become a source of expense, and a demand from fertilizer manufacturers for such parts as were not wanted by the glue maker opened the way for a utilization of by-products, which was greatly facilitated by the introduction of a system of ice refrigeration and transportation. This made it possible to slaughter live stock in the West and ship the edible portions to the consumer at distant points, allowing the conversion of the offal at the point of slaughter into by-products, such as soap, glue, fertilizers, etc., thus saving the cost of transportation as part of the live animal.

The blood from slaughtered animals has long been utilized for the production of albumen, for the use of the calico printer, the tanner, the sugar refiners, and others. The bones of animals are used for a score of different purposes; those coming from the cooked meat are boiled, and the residual fat and gelatin are extracted; the former is used in the manufacture of soap, and the latter, for various objects, as transparent coverings for chemical preparations, etc.

The bones from the feet of cattle are used in the manufacture of toothbrush handles, knife handles, chessmen, and for whatever purpose ivory is used, since the hard bone takes a very high polish. The knuckles from these bones are cut off and used in the manufacture of glue and for fertilizer. The tip of horns is sawed off, and the horn is split and pressed out into a flat plate under heat and pressure. These plates are used in the manufacture of combs, backs of brushes, large buttons, etc. The tip of the horn is made into mouth pieces for pipes and various other articles. The horn scrap is used for fertilizer.

Hoofs are sorted into three grades: White hoofs, which are sent to Japan and there used in the manufacture of various ornaments; striped hoofs, which are worked up into buttons and horn ornaments; and black hoofs, which are used in the manufacture of cyanide of potassium for gold extraction, and also ground up to make fertilizer for use of florists, grape growers, and others.

Neat's-foot oil is extracted from the feet, and various oils are taken from different portions of the animals. These all have a high commercial value.

A patent was granted in 1898 to

Alexander Mitscherlich, of Germany (United States patent No. 602237), for a process and apparatus for converting bones at a small cost into useful adhesive matters: at the same time certain fermentable substances which can be used for producing alcohol and phlegma (distiller's wash) are by-products of the process. The process consists essentially in dissolving waste bony matter, such as horns, hoofs, hair, and the like, and precipitating this solution by the tanning principle found in the lyes obtained in the manufacture of sulphite cellulose.

A valuable branch of the utilization of fat of beef and hogs is the manufacture of substitutes for butter, toward which experiments have been made with more or less promising results within the last thirty years. In 1870 a French chemist found that carefully washed beef suet furnished a basis for an excellent substitute for dairy butter. Since then a large industry has grown up in the manufacture of such articles as butterine and oleomargarine.

An important article obtained from fat is glycerin, which is brought into commerce as refined or distilled glycerin, or as an element in glycerin soaps, toilet preparations, roller compositions, etc. Glycerin was once a waste article produced in the manufacture of candles from palm oil. It was found necessary to abstract this substance, as it caused an unpleasant smell when the charred end of the wick went out. This substance was first allowed to float off into the river, the loss per week at some factories being estimated as high as \$2,000. This loss has been eliminated since the valuable qualities of the by-product have been ascertained. The application of glycerin in medicine, and for technical purposes, has made it important to extract and purify this article whenever possible, and now its value, in relation to other fat constituents, is great.

The two methods of saponification by which glycerin has been obtained on a large scale, are the processes of Wilson and Payne of decomposing the fats by superheated steam and after distillation, and the lime autoclave process of Milly.

Dr. S. P. Sadtler, in the third revised edition of his work on organic chemistry, says:

"It is obvious that in soap making, as numerous quantities of the fats are decomposed, corresponding quantities of the glycerin go into the spent lyes. It is only very recently that it has been attempted to recover this glycerin, and no perfectly satisfactory process seems as yet to have been adopted. More practical, in the opinion of those qualified to judge, seems to be the idea recently put forward to deglycerinize all fats before saponifying them. The process of Michaud Freres, of Paris, realizes this idea very successfully."

A suggestive invention was patented in 1898 (Letters Patent No. 602725) for the recovery of glycerin from tank waters, that of utilizing the waste products of slaughterhouses and rendering establishments. Tank water, as is well known, is a by-product of rendering establishments produced in cooking, under pressure, the scraps of meats, bone, sinews, lungs, intestines, and other nitrogenous matter containing more or less fat: such cooking being continued for several hours, until the substances in the tank are decomposed to a great extent and the fat liberated. A large part of the nitrogenous matter remains in solution

in the liquid produced from the solids introduced into the tank and from the condensed steam. The fats rise to the surface, while the undissolved matter, to a great extent, settles to the bottom of the tank. The liquid lying between the fat and the solids, or "tankage," in the bottom of the tank is known as "tank water." After the fat has been skimmed off, the water is drawn off from the tankage and disposed of in various ways. This tank water was for many years discharged into the sewers, although it was known to contain valuable nitrogenous matter, and even at the present day it is thus disposed of in almost all houses of small capacity.

There was imported into the United States for the fiscal year 1899-1900, crude and refined glycerin to the value of \$2,128,670.50.

Red bone marrow is a valuable by-product of the slaughterhouses. The marrow found in young animals has the most active properties, and is obtained from the finer medullary substances of the rib bones of young cattle, and contains less fatty principles than that derived from the long bones, and must be extracted immediately after the animal has been killed, else molecular death of the marrow ensues. It unites with the unaltered proteids of the blood, and is of the highest nutritive value. Finely comminuted calves' ribs, being richest in bone material, are selected from recently killed animals and macerated or digested in chemically pure glycerin for several days, until extraction is complete. The medullary glyceride is then strained or filtered off for immediate use as a palatable preparation. This product stimulates the formative processes and increases the rate of production of the red blood corpuscles.

Gelatin, or, in its lower grades, glue, is a by-product of the slaughterhouse, as the bones of animals contain on an average nearly one-third of their weight of organic constituents, which may be extracted by boiling and converted into gelatin or glue. This, though inferior in adhesive power to that prepared from animal skins, is of much commercial value. The soft bones of the head, shoulders, ribs, legs, and breast, and the bony core of the horns of horned cattle, and especially deer's horns, yield a larger quantity of gelatin or glue than the hard thigh bones and the thick parts of the vertebra, which are principally composed of calcium phosphate and

require a more prolonged treatment to extract the gelatin-making constituents. The most important gelatin yielding material is the hide of animals, obtained from the trimmings of ox, sheep, and calf skins, the refuse of the beam house, and scraps which have been softened and the hair removed by liming to get them in condition for boiling. The epidermis and the underlying fat tissue are not valued as glue stock. For gelatin, calves' hides are the most valuable, forming a special article of commerce after being limed and dried.

Slaughterhouse by-products that are utilized include—gelatin, glue, fertilizers, hair, curled hair, bristles, blood, neat's-foot oil, bones, horns, hoofs, glands and membranes, out of which are obtained—pepsin, thymus, thyroids, pancreatin, parotid substances, suprarenal, capsuls, etc., soap stock, glycerin from tallow, brewer's isinglass, albumen, hides, skins, wool, intestines.

#### Preventing Electrolysis of Underground Gas and Water Pipes.

It has been suggested recently that damage to pipes from this cause may be averted by insulating the joints of the pipes at more or less frequent intervals so that they shall offer a poor path for the return of stray currents. It would seem, however, that the plan would be available at best only in the case of new pipe lines, or in single instances, for obviously it would not be practicable to disturb the entire pipe system of a city to insulate the joints. Besides, it has yet to be demonstrated that a durable insulating joint for gas and water pipes is procurable. Vulcanized fibre has been proposed, and, in fact, tried with some success for such joints, but this material does not yet meet the general approval of gas engineers. Perhaps relief from electrolytic damage of the nature in question may ultimately come by the compulsory employment of the double trolley system, or by the adoption of the alternating current, when a practical alternating current system and single-phase motor shall have been evolved, in place of the direct-current systems and motors now almost universally employed for electric traction purposes. It is within the possibilities that this consummation is not so remote as may be generally thought, a single-trolley railroad in which single-phase motors will be employed having already been contracted for to connect the cities of Washington, Baltimore and Annapolis.—*Cassier's Magazine*.

## PATENTS

Send Your Business Direct to Washington .:. .:  
:. .: Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-TWO YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

### INVENTIVE AGE

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

E. G. SIGGERS, 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Jesse H. Alexander, Williamstown, Mo. Two patents. Flood Gate and Design for Rein Guide.—Every farm which contains ditches, creeks, or other water courses, requires a flood gate, and one of the best which has been devised, is that patented by Mr. Alexander. It consists of a cylindrical beam or sill, to which are attached a number of pickets. This beam or sill is mounted between a pair of up-rights or posts which are located at opposite sides of the creek. The inner side of one of the posts is provided with a concaved recess which forms a seat for the reception of one side of the beam or sill. A cross bar connects the opposite posts and forms a fulcrum over which the gate turns. An anchor chain is connected to the gate at a suitable point. Beyond the posts, and in line with the sill, stop-posts are provided to prevent any excessive lateral movement of the gate. The gate works automatically and never gets out of order. It can be constructed by any farmer, and when put in use, will last an ordinary life time.

The second patent relates to guides adapted to be secured to the harness. An open base frame is employed, which is made of angularly disposed longitudinal and transverse bars. Ears project from opposite portions of the side edges of the frame, and strap-engaging openings are made in the ends of the frame and in the ears. An upstanding longitudinally disposed rein guide frame projects from the base and comprises oppositely disposed guide loops, the inner ends of which are spaced apart. The loops are connected by a cross arm, upon which is located an ornamental head that is secured to the arm by a contracted neck and has artistically arranged eyes or openings therein.

Edgar C. Wiley, Inventor; H. E. McWane, Assignee, Lynchburg, Va. Hydraulic Crane.—The patent recently issued to Mr. Wiley is one of extraordinary interest, for the reason that it involves a broadly novel hydraulic crane of the type used to lift and transport objects of immense weight. The crane, which has been practically tested, involves the usual rotatable mast, a jib extending horizontally therefrom, and a trolley mounted to travel on the jib. The load-lifting tackle is suspended from the trolley; and mounted directly upon the mast are three motors, one for lifting the load, another for swinging the mast to transport the load from one point to another, and the third for operating the trolley in order to move the suspended load toward or from the mast, as the case may be. The chief novelty resides in the mounting of these motors on the mast proper, where their weight is brought almost directly over the stepped bearing. Another important feature, however, and one which has been accorded broad protection by the Patent Office, is the provision of means for supplying motive power to all of the motors, and individual controlling means for each motor, this controlling means involving valve mechanism located within convenient reach of an operator supported upon a stand projecting from the side of the mast. By this arrangement of the parts, the several motor mechanisms are under the complete control of the operator, whose supporting stand is shiftable with the mast in a manner to permit his constant observation of the work being performed by the crane.

William C. Cortelyou, Oblong, Ill. Two patents, Skirt Supporter and Cuff Holder.—The first patent relates

to what is known on the market as a skirt supporter. It consists of an eye-plate and a hook-plate, said parts being associated with the band of the skirt and adapted to be brought into engagement with each other to hold the skirt in position. Combined with the hook member is a locking device which prevents accidental separation of the two plates, and is provided with two hooks. Attached to the waist is a plate provided with openings to be engaged by the hooks of the locking device. The plates may be stamped out of sheet metal, and can be applied to a skirt by an inexperienced person, and will fulfill the wants of those who have been looking for a proper skirt supporter.

The second patent relates to that class of cuff holders, wherein the cuff is supported from the inside of the coat sleeve. The device comprises two pivoted members carrying a button or projection for engagement with the buttonhole of a cuff, and also with means forengaging the loop of a safety-pin, which is secured on the inside of the coat sleeve and constitutes the holder supporting means. The parts of the cuff holder are so constructed that when closed, they will be held from accidental opening. By means of a device of this character the wearer may remove his coat and leave the cuffs attached thereto. At the same time, the cuffs may be detached very readily by inserting the fingers between the coat sleeve and the cuffs, and releasing the connection with the safety pin.

Both of these devices are being manufactured at the present time, and the inventor should receive handsome returns from his inventions.

Daniel Warner, Bronson, Michigan. Two patents. Drilling Machine, and Mud Guard for Vehicles.—The well drilling machine embodies a duplex drill, consisting of inner and outer concentric drill members. These members are reciprocated in alternate directions to strike alternate thrust blows during the drilling operation, and the inner drill member is also rotated, whereby it constitutes a combined thrust and twist drill. The device is exceedingly simple, the reciprocation being imparted to the members by means of a walking beam operated by mechanism which is also geared to the inner member in a manner to effect the rotation of the latter. The inner member by a combined thrust and twist produces a cavity, the walls of which are broken down by the thrust of the outer member. This drill will undoubtedly develop a maximum efficiency, and as Mr. Warner has secured a patent of unusual breadth, his monopoly should prove to be one of great value.

Mr. Warner's second invention is designed to prevent dirt and mud being thrown into a vehicle, and is an improvement on a former patent granted to the same inventor in 1899. The invention is really a supplemental dashboard that is pivotally supported on the cross bar of a pair of shafts, and is arranged to be fastened in an upright position or lowered out of the way when the roads are in good condition. Means of a novel nature are employed for securing the dashboard in upright position, the supports having upstanding fingers provided with seats in their inner faces, and the dashboard frame having spaced standards that detachably engage in the seats, the lower ends of the standards having pivotal as well as sliding engagements with the supports.

David J. Farthing, Butler, Tenn. Loading and Unloading Apparatus.—The object of the invention is to provide means for loading shocks of grain, corn, hay, fodder, and the like from a standing position in the field to a vehicle, so that the same may be carried to any point, and then unloaded to a standing position. The

invention consists of a frame hinged to one or both sides of the vehicle, shock-engaging means carried by the frame, a lever mounted upon the frame to swing the same upwardly upon its hinged connection, and a substantially U-shaped swinging standard, having its opposite ends pivoted to the hoisting frame, and provided with a flexible brace extending between the standard and the rear portion of the husking frame, said standard engaging the ground and supporting the hoisting apparatus in position for engagement with the shock. The shock-engaging means mounted on the hoisting frame consists of a windlass on which is wound the two ends of a rope, the windlass being provided with an operating crank, and the rope traveling between friction rollers. The invention can be applied to the running gear of a wagon or the bed of a sled without altering the same in any manner. It has been fully tested and found to meet the wants of farmers.

George E. Paton, Fayetteville, N. C. Mechanical Toy.—The device covered by this patent, while serving as a toy, can also be used for advertising purposes and during political campaigns. It is shaped to simulate the head and neck of a rooster, and is provided with means arranged within the interior thereof, whereby a shrill harsh sound in imitation of the crowing of a rooster may be given at will. Suitable connection is made with the jaw or bill of the device, so that when the sound is given the jaw is opened and closed. An exposed string is provided by which the mechanism is operated. The device is very simple, and will furnish considerable amusement to young and old. Instead of constructing it in the form of a rooster, other shapes of heads could be devised. The device provides an attractive advertising specialty, and should meet with much success.

Clayton P. Breining, Williamsport, Pa. Curry Comb.—In the ordinary type of curry comb having a laterally projecting handle, it is common to grasp the base of the handle with the thumb, and extend the fingers across the back of the body, as this manner of holding the comb has been found to be more advantageous than by grasping the handle alone. However, this manner of holding the comb has certain disadvantages, particularly so because the comb was never constructed with the idea of its being held in that way. Mr. Breining has, however, devised certain attachments to an ordinary curry comb, by means of which a curry comb may be handled in the way that people have been accustomed to hold the same, and which will enable a firm grasp to be obtained on the comb and prevent the finger tips from scratching the horse. Two attachments are provided. One is a finger grasp designed for application to the front edge of the back of a comb, and to be grasped by the several fingers of the hand, and serving to stiffen the comb back and also to provide knockers for contact with some object when cleaning the comb. The other attachment is a thumb grasp constructed for application to the rear side of the usual angular handle shank, and provided with means for connection with the back of the comb and the handle thereof. These improvements can be applied to the ordinary curry comb without altering the construction. The cost of the additional attachments would be only a few cents, but the convenience of handling the comb would be materially enhanced and the life of the comb increased.

Edmond Martin, Potsdam, N. Y. Spray Nozzle.—There have been all kinds of nozzles patented, but the one which is the subject of this article, is the simplest that has been devised, and yet it contains a variety of adjustments possessed by no other nozzle.

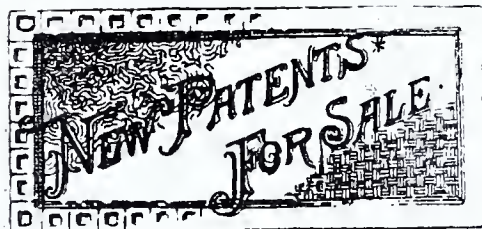
The particular object of the invention is to provide for controlling the direction of the discharge, so that the water may be discharged laterally in any direction and cut off in the opposite direction, this feature of the invention being designed to obviate the wetting of the walk or the side of a building, at the same time effectually sprinkling the adjacent portions of the ground. The invention is also adapted to provide a fine spray or broad projected sheet of water in the nature of a fountain. The device is made up of three parts; first, an open-ended tubular body provided at one end with a coupling for connection with a hose, and having an interior cross bar or bridge formed with a screw-threaded opening; second, a baffle or sprayer plate rotated by means of two handles and having a threaded stem to work through the opening of the bridge, and provided on its inner side with a concentric groove; third, mounted exteriorly on the tubular body is a rotatable and endwise slidable adjusting sleeve, which sleeve is limited in one direction of its movement by a stop shoulder formed on the body, and in its opposite direction by the periphery of the sprayer plate. By adjusting the sprayer plate and sliding the sleeve, a variety of jets or streams may be secured, and the direction thereof altered as already explained.

John Sanders, Dundee, Texas. Plow.—The invention is a plow point and share of a peculiar construction, designed to loosen and pulverize the upper surface of the ground without turning the same over. In this way furrows are not formed, and the plowed ground retains its moisture for a longer time than when it has been worked by an ordinary plow. The invention has the further advantage that all trash and stubble remain upon the surface of the ground instead of being turned under. It consists of rearwardly diverged blades which are set at an angle and have their front ends mitered and abutted, and a base or attaching frame having substantially parallel members to embrace the plow standard. Wings are provided at the front ends of the parallel members to fit snugly against the under sides of the blades, one of the members having a front projection fitting in the angle between the intersected blades. A share is applied to the outer sides of the abutted ends of the blades, the forward end of the share being projected at the front of the blades and the rear portion of the share being extended rearwardly between the blades and bowed upwardly and laterally to form a deflector or moldboard. Fastening means connect the share and the forward projection of the base, and other fastenings connect the blades to the wings.

David Y. Wilson, Cochranville, Pa.; Robert Hamill, Cochranville, Pa., assignee of one-half interest. Milking Machine.—The object of this invention is to provide a simple and comparatively inexpensive machine, by means of which a cow may be rapidly and thoroughly milked with little labor, and without in any manner injuring or irritating the animal. A body piece is yieldingly supported by straps upon a cow in engagement with the udder, and is provided in its opposite side walls with open-sided teat-receiving recesses. To the body are hinged pressing devices that are connected by hooks with the operating mechanism, these pressing devices being movable into and out of the recesses. The operating mechanism consists of a rock shaft having crank arms which carry the hooks, said shaft being provided at one end with a handle crank. A suitable receiving funnel for the milk is placed beneath and detachably secured to the body, and a tail-holding device constitutes a part of the structure.

The invention has been tested by the inventor and been found to meet the requirements.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 712,720, November 4, 1902. Air Bed, Cushion, etc. Sanitary, economical and convenient. Simple, cheap, yet strong and durable. Especially convenient for soldiers, hospitals, etc. Will sell outright. Address Fannie L. Richardson, Corinth, Miss. (mch)

**FOR SALE**—Patent No. 708,272. Spring Vehicle Brake. Address James A. Tautphaeus, Sappington, Mo. (mch)

**FOR SALE OR EXCHANGE**—Clipper Currycomb. Will clean an animal better than any other. Patented in United States October 14, 1902, No. 711,423. Canada, December 9, 1902. Price \$20,000 for both countries. Address Frank L. Greene & Bro., Wellsboro, Pa. (mch)

**FOR SALE**—Combination tie plate and rail bracer. Great tie saver. Should be used on all curves. For particulars address A. J. Flynn, 722 E. 137th St., New York, N. Y. (mch)

**FOR SALE**—Patent No. 711,799. Four Horse Draft Evener. Especially designed for 16-inch sulky plows. Works perfectly in every way. Address Henry A. TePoel, Prague, Nebraska. (feb)

**FOR SALE**—Patent No. 656,406, August 20, 1900. Apparatus for Lining Engines. Line can be set accurately, instantly. Micro-mic indicators detect any misplacement. Charles H. Hopkins, 52 Pleasant St., Portsmouth, N. H.

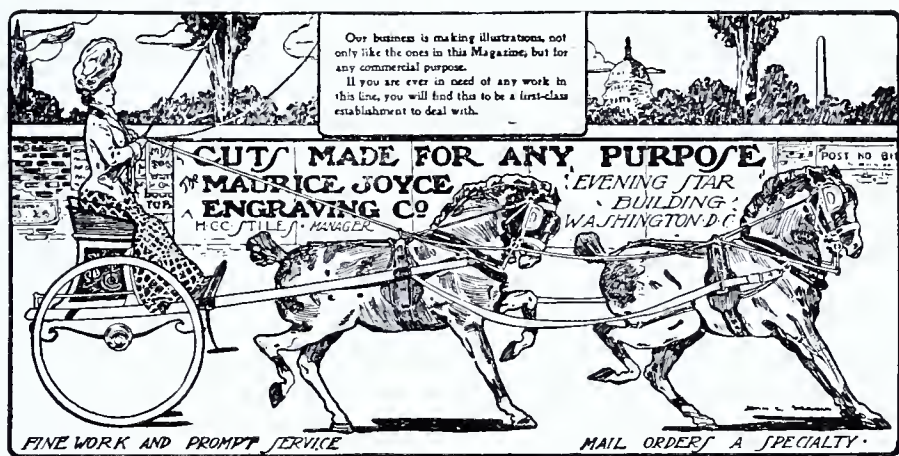
#### WANTED.

**WANTED**—A fully equipped Machine Tool Company wishes to add to their line of goods. Also solicit metal pattern work, perfection of models, jobbing, &c. Address C. N. Grace, 341 W. 20th St., Erie, Pa. (mch)

## CAPITAL

Can be secured for the right kind of inventions. Perhaps we can help you.

**W. C. & F. D. BURGESS,**  
NEWARK, NEW YORK.



Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING CO., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

### "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O. ....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

## YOU SHOULD SUBSCRIBE FOR THE ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. The ARMY AND NAVY MAGAZINE, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, \$3.00 a year.

## Magic Rheumatic Cure!

It absolutely does cure. It is not a cheap remedy but it is a cheap cure. Mark the distinction! There are a thousand remedies to one cure. This is a CURE. It costs \$2.00 a bottle, and is worth \$20.00 to any sufferer. All good druggists sell it. If not, don't let them "stuff" something else on you. We will send prepaid for \$2.00. Book free. Agents wanted.

MAGIC CURE CO.

R. 331-315 Dearborn St. Chicago.

## THE AMERICAN Land and REGISTER.

Devoted to the Interest of Real Estate Dealers and Owners;

Including municipal affairs, Public Improvements, Taxation and Kindred Topics.

Subscription \$1.00 per annum.

Published monthly. Send for free sample copy.

DETROIT, MICHIGAN.

## SEND

5 cents in stamps and we will mail you one of our Red Rope Pocket Books. Wear like leather.

FRED. B. NICHOLS & CO.,

913 E St., N. W.,

Wholesale Stationers, Washington, D. C.

—WE SELL THE BEST—

## Machine Tools

FOR THE AMATEUR

AND FOR THE BIG SHOP.

—Prices always reasonable—

HILL, CLARKE & CO.,

CHICAGO, BOSTON. NEW YORK.



## The Manhattan

Typewriter,

Guaranteed to be of the Highest Grade.

NOT IN THE TRUST.

PRICE \$50.

JOHN C. PARKER,

619 Seventh St. N.W., Washington, D. C.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,

Send for sample copies. ALLENTOWN, PA.

## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America.

For rates, address—

The Railway and Engineering Review,  
1305 Manhattan Building, Chicago.

## A NEW BOOK FOR INVENTORS. Patents and How to Make Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— The Inventive Age Pub. Co.,

918 F St., N. W. WASHINGTON, D. C.

E. C. WILEY,

Mechanical = = =

= = = Engineer,

Office 811-1-2 Main Street,

Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.

## RIPANS



The simplest remedy for indigestion, constipation, biliousness and the many ailments arising from a disordered stomach, liver or bowels is Ripans Tablets. They have accomplished wonders, and their timely aid removes the necessity of calling a physician for many little ills that beset mankind. They go straight to the seat of the trouble, relieve the distress, cleanse and cure the affected parts, and give the system a general toning up. The Five Cent packet is enough for an ordinary occasion. The family bottle, 60 cents, contains a supply for a year. All druggists sell them.

## THE AMERICAN HAY, FLOUR, AND FEED JOURNAL.

The Recognized Organ of the Dealers in Hay, Flour and Feed. A Magazine that brings the Miller and Shipper in touch with the Dealer. It shows the Dealer where to buy his Goods.

PUBLISHED MONTHLY.

Subscription price, 50 cents a year, in advance. Sample copy sent on application.

SHIPPERS & RECEIVERS PUBLISHING COMPANY.  
Produce Exchange. New York City.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to

THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, JANUARY, 1903.

### Cures Caused by Light.

"Truly the light is sweet and a pleasant thing it is for the eyes to behold the sun."

The uninitiated will be slow to believe, and the doubting Thomas will demand the production of the cured patient, but it is a fact that nature's right-hand therapeutical agent, light, is bringing about some wonderful cures.

Take an anaemic subject, disrobe him and make him spend a certain time each day in a solarium. Tint the walls, and give him a straw hat that the glare may be tolerable to his eyes. You will be administering the "concentrated light treatment." This is the *twentieth century* appellation. It looks suspiciously like a return to primitive conditions. Are we, after all, so wise in our day and generation as we flatter ourselves we are?

When we hear of cures effected by light, one begins to wonder why man has stood in his own light through so many centuries—in fact, ever since he began to shut himself up in houses: to shut out the light and to shut in disease.

This concentrated light treatment has been found especially efficacious in the removal of birthmarks of the wine-stain variety. It will be a great joy to this class of unfortunates to know that science promises to come to their relief. Surely the world owes the professor who is advancing this new therapeutical school, a great debt.

From an ethical standpoint, as the introduction of light dissipates darkness, so the introduction of physical light to a patient dissipates disease, physical and moral. "The entire physiognomy of the patient undergoes a change. The eyes take on an added brilliancy. The carriage becomes more erect. It were as if a new dawn had arisen, a regeneration where the victim of this disease is once more to be restored to his fellow men." Literally, the patient rises, phoenix-like, on stepping stones of his dead self to higher things.

### Something About Coal.

The old world has been turned wrong side out in the last few months. Herinmost secrets have been ventilated alike by tongue and pen. Perhaps not since her treasure was hidden safely away in the bowels of the earth, has so much sweat and ink been poured forth in a burning cause. And what is all the noise about? The people must have artificial heat to keep from freezing. Such is the price of *civilization*. Of course this is not the total cost. Even a superficial thinker will understand what we are pleased to call the moral guilt of clothing. Nature, always kind and wise, gave to primitive man, as she gives to animals, a thick layer of fat just underneath the skin which conserved heat. Thus our forefathers in their birthday clothes survived rigorous winters and were blissfully ignorant of the pills and powders, lotions and plasters and red flannel of their degenerate descendants. When we consider what tight clothing has done for the mothers of the race, the hysterical straining after effect, the time and money sacrificed on the altar of Vanity, following the fashion becomes a crime and the invention of clothing mortal.

But we are called on to face the situation as it is; not as it should be. We are a race of physical degenerates absolutely dependent on artificial warmth. Hence any consideration of the coal question is grateful. Who is it that has not expressed some opinion on the coal question during the last six months? It is one of the most interesting subjects before the people today, and will continue to be until the genial spring sun reminds us that we can afford to leave it buried for awhile.

Some one believes that if mining continues at the present rate, within 400 years all the mines will have become exhausted. This gives the bright minds 400 years in which to find substitutes for coal. But it looks as though they will not need four years; for, if the growing use of substitutes for coal continues, at least one man believes that coal mining will not pay ten years hence. Certainly that king of fuels, anthracite, must henceforth divide honors with his subjects. He will never again resume his exalted station.

And now that circumstances have consigned us to the reign of soft coal, and bitumen is exercising a smutty tyranny over us, smoke-consuming furnaces are the one thing needful. They would afford indeed a merciful deliverance from a murky pall. Since bituminous coal has come into widespread use, our formerly clean cities are dirty. We can leave home with clean faces in the morning, but we have no assurance that they will be presentable by the time we get down town. If you happen to rub your hand across your face at the time when coal refuse has alighted on your glove, you have the appearance of a street gamin.

It is, therefore, gratifying to know that relief is in sight. The large con-

cerns which pay from a few to fifteen hundred dollars for a smokeless furnace, have solved the problem of the soft coal smoke nuisance. It will not be long before some bright mind will invent a smoke-consuming furnace which will come within the means of the average householder. Such a one will suddenly become a millionaire.

The methods devised for the consumption of soft coal are ingenious. One invention consists of a mechanical stoker which shovels in coal at the edge of the furnace and forces whatever smoke rises to pass the length of the firebox over the fire. A hot air blast brings about nearly complete combustion.

Another economical burner has an arrangement for reversing the draught, thus causing the flames to fork downward through the grate instead of up. Gaseous smoke is forced down through the fire. Thus all the gases descend. Underneath the main grate is a smaller grate which catches the small pieces of partially consumed coal. Any gas which escapes the upper grate is burned in the passage between the two grates. Although expensive in the narrow sense, these smoke-consuming furnaces are economizers of coal and money; for bituminous coal is half the price of anthracite and yields seventy five per cent less refuse.

### Glass.

The manufacture of glass dates back five thousand seven hundred years before Christ. In Egypt, Phoenecia and Rome, glass was in familiar use centuries before the Christian era. The ancients blew it through long tubes, as do we. But it was not until the seventeenth century that the art of making glass, in which lead is the essential base, was discovered in England. In glass which is to be cut and polished, the base is chiefly oxid of lead, which sometimes amounts to half the weight of the material used.

This crystal glass had greater density and power of refraction than the ordinary glass, was more easily manipulated, and hence was the first glass suitable for cutting.

Before the seventeenth century, glass articles had been ornamented in various ways, and engraved, but no cutting such as we now execute in some of our Eastern factories, could be accomplished.

Let us pay a hasty visit to one of these cut glass factories. At a bench sits a skilled artisan holding a vase in the rough against a wheel on which a small stream of sand and water descends. This is called grinding glass by a sand blast. After the first cutter has given a general contour to the vase, he turns it over to a second experienced hand, who manipulates it, without chipping it or cutting too deeply against a wheel of finer edge. This second cutter in turn passes it on to a third who puts a still finer polish on our vase. Thus it goes the rounds, becoming more beautiful at every turn, and ultimately landing in a room where noxious acids give it the finish-

ing touches and adorn it with prismatic beauty.

Innumerable are the uses to which glass is put. It has now come to pass that my lady wears glass soles in the bottoms of her shoes. Thus is she insulated and prevents her magnetism from going off into the ground. She also places glass rollers on the posts of her bed for a similar reason; and when she is restless and suffering from insomnia, she presses a button which establishes connection with the earth and relieves her of a surplus amount of animal magnetism!

### Thermite.

Science bids fair to wrest another secret from the heart of the earth. Vulcan must look to his laurels. She did not find it necessary to descend to his Tartarean abode, but by laboratory delving she has made the wonderful discovery of a new heating force which she denominates thermite. This new compound only awaits ignition to produce a temperature of 5,400 degrees Fahrenheit.

Better still, not only can this remarkable compound be produced at a few moments notice, but it can be harnessed and regulated for use in factories, foundries, machine shops, and wherever iron and steel are shaped for the mechanical trades.

It acts as a refiners' fire and produces fine metals in a state of purity. It enables the artisan to wield the hardest granite and steel as if they were potters' clay.

And what is this great energy which bids fair to revolutionize many lines of industrialism? Nothing but the force produced by igniting a mixture of aluminum filings and oxide of chromium.

In every such triumph of science, nature says to the student, you have asked for a stone in your groping and blindness. I have given you bread.

### A Much-Needed Device.

The report of the New York-Boston and return, reliability contest shows that the greatest number of stops of gasoline machines were those due to ignition troubles, and of these a large proportion were caused by fouling of spark plugs.

It should not be such a difficult problem to devise a spark plug, which would not be subject to this trouble, and we have no doubt that there are at this time entirely satisfactory plugs to be had.

Our experience has been that the greater number of breakdowns or stops of automobiles are due to just such small causes as a foul spark plug or loose nut, and while these troubles are not serious, they are very annoying. The automobile manufacturers should profit by the experience of the early trolley roads, and devote more attention to minor details of construction. It was not until this was done that the trolley car became a pattern of reliability.—*Electrical Review*.



## SCIENTIFIC



## PROGRESS.

## A New Formation of Cables.

Mr. Russell Spaulding, of New York City, has devised a new process of forming conducting cables. He first forms a core from a plurality of fine wires. This is accomplished by braiding the cores about a former or mandrel, so that they shall be hollow and approximately circular in cross-section. After the tubular core is obtained, it is flattened to give it approximately a rectangular shape in cross-section. The core in its flattened condition is then run through a suitable apparatus to apply insulating covering, preferably the usual rubber composition. A single conductor may be placed in a cable of this construction, or a plurality may be included in a single insulation, being insulated from one another by intermediate partitions or walls.

## A New Car-Wheel.

A new car-wheel, constructed entirely of plate metal, has been patented by Mr. Henry F. Mann, of Allegheny, Pennsylvania.

In order to secure the desired results in the practice of the invention, and make a car-wheel which will have the necessary strength and possess the desired degree of hardness on the outer or wearing surface of the tread and rail-flange, the web, tread, and flange are made of a single plate of steel or a single plate of steel and iron. If the plate is made of steel, three-fourths of its thickness, more or less, is composed of low-carbon tough and strong steel, and one-fourth of its thickness, more or less, of high-carbon hard steel. If the plate is made of steel and iron, three-fourths of its thickness is composed of wrought-iron, and one-fourth of its thickness of high-carbon hard steel. In either case, the different compositions of metal of which the plate is made are to be properly cemented or welded together by any known process.

The hub may be made of wrought steel or iron or of cast metal; but in cases where it is secured to the web in whole or in part by welding, it is made of suitable weldable metal.

## Arc Lamp Carbon Electrode.

A Frenchman, M. Andre Blondel, residing in Paris, has patented in this country a composite carbon electrode for arc lamps.

The invention relates to an improvement in the manufacture of carbon electrodes for arc lamps, in which to the carbon base are added coloring and light-producing salts—such, for instance, as salts of calcium, magnesium, barium, sodium, potassium, thorium, caesium, and the like—in order that the luminous efficiency of the arc may be enhanced. These composite carbons are well known in the art, and have been tried by several scientists. The chief obstacle to the general employment of such carbons has been the fact that in the heating of the prepared carbon, its salts in melting produce abundant scoriae, which

either drop from the carbon or obstruct the arc.

In the present invention a means is devised for making the electrode whereby all or nearly all of the scoriae are gotten rid of; and to this end the invention consists in forming the main part or body of the electrode of carbon combined with the salts of calcium, magnesium, and similar light-producing salts, and in coating or inclosing said body with a substantially thin layer of non-scorifiable carbon. This layer consists either of pure carbon, or carbon combined with a small percentage of the light-producing salts, and serves to protect the main part or body of the electrode from being superficially burned or licked by the flames before the production of the arc required.

## Manufacture of Sand Cores.

As is well-known, sand cores, usually employed in foundries, are composed of sand mixed with some kind of binder that will make the core very strong after it has been baked and cooled, and this binder must be of such a nature as to soften when the iron or brass comes in contact with it in the mold. The iron or brass when in a molten state must lie smoothly against the core, and if the binder or core compound is not softened by the heated metal, but remains hard, the metal will blow or not lie up to it; yet the core must be very strong in order to stand the strain when the molten metal first strikes the core. Oil, (principally linseed-oil) rosin, molasses, and glucose are the principal bases for all binders or core compounds, and in order to bake cores made by these compounds, it is necessary to have a heat sufficient to practically fuse the rosin, glucose, or other core compound, and when oil is used the heat must be sufficient to actually bake it dry. In the baking of cores, it is of the utmost importance that they be subjected for the proper length of time to a suitable temperature, and the invention recently patented by Mr. Alfred M. Hewlett, of Kewanee, Illinois, has to do with a method of operation by which this result may be accomplished. It is also important that the cores be properly cooled before being handled after baking, as while hot they are tender and easily susceptible to injury; and the invention also includes a method by which the cores are protected from injury until they have been cooled sufficiently, so that they are hard and not readily damaged. The improvement consists first in conducting the green cores continuously into, through, and out of a suitable oven or chamber heated throughout to a substantially uniform temperature. In this manner it is possible to determine with a high degree of accuracy the extent to which the cores are baked, and thereby avoid all danger of under or over heating.

It also consists in conducting the cores into, through, and out of a suitable baking oven or chamber, and in conducting the cores for a sufficient space of time outside the oven to permit them to cool before being handled, thus avoiding the danger of breakage, which invariably attends the handling of hot or warm cores.

## An Improved High-Tungsten Steel.

The Carpenter Steel Company has obtained a patent on an improvement in high-tungsten steel, the invention of Mr. George B. Brown, of Reading, Pa. The invention relates to the manufacture of high-grade steel; and it consists, essentially, in the admixture of a large proportion of tungsten, with iron or steel, whereby a new description of steel is produced, possessing valuable qualities not heretofore attained and remarkably well adapted to certain uses such, for instance, as the manufacture of projectiles. The invention further consists in the admixture with this tungsten steel of a suitable proportion of chromium, whereby its qualities are changed as desired to meet somewhat different requirements, while retaining the essential characteristics imparted by the tungsten. The limited use of tungsten in the manufacture of steel has been heretofore practiced in the production of what is known as "self-hardening" or "air-hardening" steels intended particularly for making metal-cutting tools, the purpose of such steels being to secure increased working capacity by avoiding the injurious effects upon the tool which ordinarily result from the high temperatures produced by continued hard service. Heretofore, however, the percentage of tungsten employed in the manufacture of steel has been confined within comparatively narrow limits, and generally in connection with another element or elements considered essential to securing desirable results. The experiments on which the practice heretofore has been based, have been found to demonstrate that as low as one per cent of tungsten produced marked effects, and that no materially-improved results were to be obtained by increasing the proportion of tungsten used to above six per cent. Mr. Brown was led to go into such experiments particularly by the desire to produce a steel product especially adapted to the production of projectiles of greater penetrative capacity than those heretofore produced, and by appreciation of the fact that the great atomic weight and specific gravity of tungsten, aside from its known effect when used in small proportions upon the hardness and fusibility of the steel product in which it is used, might be of great value if it could be successfully incorporated in large proportions, because of the resulting increase in the weight of a given size of projectile, and the corresponding increase in force of ballistic impact and penetrative efficiency obtainable at given velocities. As the result of such experiments, extending from the use of twelve and one-half to thirty-five per cent of tungsten, not only has the desired result been secured by incorporating such large percentages of tungsten, so far as producing a steel body of greatly-increased specific gravity is concerned, but the character of the steel is otherwise very markedly and beneficially changed by such increase of the tungsten element beyond the proportions heretofore found effective for good results.

## New Acetylene Generator.

A chemist at the carbide factory Trollhattan, Germany, has invented a new acetylene generator. This generator is said to be much simpler in construction than any yet placed upon the market, and occupies but little space. In its operation, the falling of the carbide into the water is automatically regulated by a hollow rubber ball, which, as soon as it is filled with gas, closes the valve between the carbide and the water. When the volume of gas decreases, the rubber ball contracts and the feed valve again permits the carbide to drop. The gas is stored partly in the rubber ball and partly in the space between the funnel-shaped carbide magazine and the water. If more than the normal amount of gas is generated, it secures more room by forcing the water through valves into the water jacket in the sides of the apparatus. A separate gas tank is therefore not needed. Should too much gas be produced, both the water and the gas escape through a safety valve. Common carbide is used; no cartridges. The gas is dried by being allowed to pass through the carbide magazine, where the carbide absorbs the moisture. As there is no gas tank, the quantity of gas stored is insignificant.

## A New Insulator.

Insulators, as commonly constructed, are made of a single piece of glass or rubber with a comparatively short distance between the wire and its support. A new insulator, designed especially for use with conductors of high potential current, has been patented by Mr. George H. Rupley, of Schenectady, N. Y., the patent being controlled by the General Electric Company. The improved insulator is a compound structure, in which a rigid insulating substance is used as the framework, the body portion being formed of a filled-in material, which is of relatively much higher insulating power. A tubular body is formed of double-walls spaced apart, the space between them being filled with some suitable solid or liquid substance of high insulating power. The walls are preferably in the form of two concentric tubes formed of some hard insulating material, such as wood, hard rubber, fiber, porcelain, or the like. The annular space between them is closed at one end by a washer of similar material, and this space is then filled with some softer insulating substance, such as oil, asphalt, resin, mica compound, or the like. The open end of the annular chamber is then closed, either by an insulating washer or an annular cap of porcelain, having double flanges fitting inside and outside the body of the insulator. If a liquid or semi-liquid hydrocarbon, or other filling substance is used, which expands and contracts with changes of temperature, a relief-vent may be employed, such as a spout projecting from the upper side of the body and opening to the atmosphere, thus permitting the filling substance to rise and fall in the spout without danger of bursting the tube. The line conductor passes through the inner tube, which is of considerably greater diameter than the same, so as to afford a body of air between the conductor and the tube, and thus add to the dielectric value of the insulator.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued December 2, 1902.

### MECHANICAL PATENTS.

- Acid. Manufacturing sulfuric.....N. P. Pratt  
Addressing machine.....2 pats.....S. Elliott  
Advertising, &c. Apparatus for.....J. A. Watson et al  
Advertising apparatus. Illuminated.....W. Schell, Jr  
Agricultural tool.....D. Lubin  
Air brakes.....B. W. Smith  
Air brakes. Quick action automatic release mechanism for.....L. Krimmelbein  
Alarm lock.....J. Graber  
Annunciator drop. Electric.....E. G. Thomas  
Applicator.....W. E. Robinson  
Apron. Storm.....J. C. Crimins  
Arbor press.....F. H. Colvin  
Armature winding for electric motors or dynamos.....R. Lundell  
Babbitting device.....J. N. Schumacher  
Band cutter and feeder governor.....E. W. Miller  
Bandage or truss. Hernial.....V. Brocchi  
Basket. Canvas.....W. M. Morris et al  
Bathing apparatus.....H. G. Batchelder  
Batteries. Manufacture of spongy-lead plates for secondary.....H. W. Butler et al  
Bearing.....F. H. Richards  
Bearing. Ball.....H. Austin  
Bearing. Center.....G. I. King  
Bearing. Collet thrust.....B. M. W. Hanson  
Bearing. Roller.....A. C. Stilson  
Bearings. Apparatus for hardening the cups and cones of ball.....C. H. Chapman  
Bed. Sofa.....A. H. Moores  
Bedstead hook and lock. Iron.....C. E. Newell  
Bedstead or bed frames. Construction of.....C. S. Lloyd  
Beer cooler.....F. Ibert  
Belt and roller press.....L. B. Eberly  
Belt tightener for water regulating devices.....A. C. Mather  
Bicycle support.....L. I. Jones  
Biscuit cutting machines. Automatic cut off for.....W. Jones  
Bit brace and chain and bench drill. Combined.....S. McClellan  
Block system. Electric.....E. M. North  
Boat.....I. H. Larr  
Boiler.....3 pats.....J. C. Cooke  
Boiler tube leak stopper.....C. S. Clark  
Boiler water gage.....A. Paine  
Bolting machine.....C. W. Hollender  
Book. Combined bank deposit and coupon.....P. Kuehn  
Book or file. Bill collecting.....G. J. Schwartz  
Boot or shoe cleaning machine.....O. Muller  
Bottle.....W. A. Swanson  
Bottle.....2 pats.....J. F. Mason  
Bottle cleaning machine.....A. A. Pindstoffe  
Bottle closure.....G. J. Adams  
Bottle filling machine.....J. Ramsey  
Bottle. Non-refillable.....U. S. Alz  
Bottle. Non-refillable.....W. F. Thompson  
Bottle protector.....J. M. & D. Raynor  
Bottles, &c. Cap or stopper for.....L. Grote  
Bottles. Pouring spout for.....V. M. Lunenburg  
Bowling alley.....R. F. Downey  
Bowling alley back stop.....D. H. Talbert  
Bowling alley pin spot.....P. J. Riddell  
Bowling game.....A. Jeisi  
Box opener.....L. McMullan  
Braiding machine.....W. F. Polesz  
Brake.....H. L. Schaffner  
Brake.....W. A. Growdus  
Brake apparatus.....C. M. Carnahan  
Brake mechanism.....R. B. Hain  
Brake releaser.....E. N. Halstead  
Bread slicer.....C. D. Spates  
Brick drying shed.....D. M. Warner  
Bricks. Apparatus for making sand.....L. T. Leet  
Bridle.....H. H. Poe  
Brooder. Chicken.....C. E. Adair  
Brush. Fountain.....G. D. Mernbery  
Brush holder.....W. D. Litchfield  
Brush. Scrubbing.....B. Rensch  
Brush. Shoe polish applying.....C. Platner  
Bucket dumping apparatus.....W. R. Wilcox  
Buckle.....J. S. Sourek  
Building construction.....W. H. Drake  
Bushings.....J. A. Bomgren  
Butter cutting machine.....S. E. Perkins  
Button. Collar.....B. Murphv  
Button. Furniture.....W. E. Bennett  
Buttons, &c., out of nacre, &c. Machine for cutting.....A. Masson et al  
Cage.....C. A. Anderson  
Camera.....C. F. J. Niss  
Can.....C. A. Doolittle  
Can.....L. C. Sharp  
Car brake lever.....W. C. Keithly  
Car brake. Slipper.....J. M. Hewitt et al  
Car coupling.....J. A. Hinson  
Car coupling.....A. D. Nichols  
Car draft rigging. Railway.....W. C. McIntire  
Car end sill.....R. H. Hornbrook  
Car fender.....H. C. Itter  
Car fender. Automatic.....H. F. Rooney  
Car. Freight.....H. A. Turner  
Car friction draft gear. Railway.....L. McKee  
Car grain door.....D. & J. A. James  
Car seat locking device.....M. Weber  
Car spring.....T. A. Shea  
Car track brake. Electric.....O. Keen  
Car wheel.....E. T. Wires  
Car wheel. Plate metal.....H. F. Mann  
Carpet beater.....F. B. Holder  
Carton or package.....J. F. Carver et al  
Cash carrier system pressure creating device.....W. G. Davis  
Cask or bottle tilter.....D. S. Campbell  
Casting apparatus. Pig iron.....K. Orth  
Catamenial appliance.....T. Minard  
Cattle guard.....J. M. McManama et al  
Cement. Apparatus for the manufacture of.....R. F. Wentz  
Cement. Manufacturing.....R. F. Wentz  
Chair.....G. F. Clingman  
Chair seat and making it.....H. B. Morris  
Chart. Graphic.....J. M. Daly  
Checker.....F. R. Mease  
Checking apparatus for restaurants or the like.....A. Nelson  
Chuck operating and feeding device.....B. M. W. Hanson  
Cigar wrapper cutting machine.....J. A. Peepels  
Cigar, cheroots, &c. Implement used in the manufacture of.....C. Millhiser  
Clamping finger.....W. L. R. Emmet  
Clay, &c. Apparatus for separating coarse and fine particles of.....M. W. Phillips  
Clock. Automatic.....R. S. Wiesenfeld  
Clock. Electromechanical.....S. H. Hoggson  
Clock. Watchman's.....A. Huberty  
Cloth cutting machine.....M. Langman  
Clothes line.....W. S. Harnden  
Clothes line supporter. Metallic.....J. B. Jackson  
Clothes wringer.....M. P. Janisch  
Clutch.....M. Langman  
Clutch. Automatic.....J. W. Kellogg  
Clutch mechanism.....J. T. Cyr  
Clutch mechanism.....H. Wyman  
Coated chemically active substance and making same.....F. J. Smith  
Coating metallic articles. Apparatus for.....J. Hroneck  
Cock. Basin.....J. P. Farley  
Coffin rest.....J. L. Brannock  
Collapsible box.....G. O. Crawford  
Collar blanks, &c.....2 pats.....G. J. Dormandy  
Color and making same. Indigo.....H. S. A. Holt  
Colter. Plov.....A. H. Johnson  
Column joint.....W. H. Fenwick, Jr  
Confections. System for heating liquid or semi-liquid.....F. P. Ziegler  
Connector.....G. W. Cravens  
Continuous downdraft kiln.....W. Radford  
Conveyer.....C. A. Gabrielsen  
Conveyer supporting roller.....W. I. Mann et al  
Coop and nest. Combined.....P. D. Cullum  
Copper and nickel. Electrolytic separation of.....D. H. Browne  
Corn popper.....J. R. Winters  
Corn shucker.....B. R. Benjamin et al  
Cotton elevator. Seed.....G. P. Harris  
Counting machine.....J. B. Sleeman et al  
Crate. Folding.....F. G. Otte  
Crucibles from furnaces. Means for lifting.....D. Laird  
Cultivator.....A. C. Baker  
Cultivator.....G. W. Toler  
Curb and conduit. Combined.....F. Lappin  
Current motor.....C. Campbell  
Current operated receiver for electromagnetic waves.....R. E. Fessenden  
Currents. Rectifier for single or polyphase alternating.....A. Nodon  
Curtain fixture.....W. Wegner  
Damper regulator.....G. F. Patterson  
Dampener regulator for hot water heaters.....D. C. Humphreys  
Dental amalgam. Means for producing.....A. A. Shaw et al  
Dental flask.....W. Waegel  
Dental instrument.....C. P. Wilson  
Dental oven.....J. A. McClelland  
Depth and inclination indicator and recorder.....H. S. Lathrop  
Despatch system. Tubular.....L. Collis et al  
Detonating device.....R. H. Opes  
Digging or cultivating land. Implement for.....T. C. T. A. & S. C. Darby  
Disinfecting apparatus.....B. M. Davis et al  
Display article.....A. H. Trimpi  
Display box.....P. A. Becker  
Door closer, check, and holder.....C. F. Sullivan  
Draft gear and buffing apparatus.....P. Hein  
Draft rigging. Friction.....W. H. Emerick  
Drainer. Cellar.....O. R. Erwin  
Draw bar rigging.....R. W. Fox  
Dredge. Hydraulic.....L. W. Bates  
Drum. Friction.....T. S. Miller  
Drying apparatus.....F. V. L. Hiorth  
Duplicating apparatus.....J. W. Jones  
Duplicating device.....J. A. Lee  
Dye and making same. Monoazo.....O. Ernst  
Dye and making same. Orange yellow azo.....O. Ernst  
Dyes. Making lakes from sulfur.....E. A. Fourneaux  
Educational appliance.....C. E. Wheeland  
Ejector.....T. S. Smith  
Electric couplings. Face plate for.....N. Marshall  
Electric current regulator.....J. W. Hammond  
Electric machines. Carbon holder for dynamo.....C. B. & W. Zabel  
Electric meter. Hot wire.....R. S. Stewart  
Electric motor. Controlling.....M. W. Day  
Electric motors. Controlling.....H. W. Buck  
Electrical service wires. Overhead conduit for.....F. C. Locke  
Electromagnetic brake.....F. Haber  
Electromagnetic device.....J. S. Hodges  
Elevator housing. Door for pneumatic.....C. Bradford  
Embroidering machine pattern mechanism.....D. Nadel  
End gate hanger. Wagon.....F. M. Sturgis  
Engines. Sparking igniter for explosive.....C. C. Chamberlain  
Enuresis. Appliance for preventing.....C. Zimmermann  
Evaporating pan.....C. A. Porter  
Exhibition and amusement apparatus.....G. H. Laporte  
Extension table. Combination.....A. F. Flatley et al  
Eyeglasses or spectacles.....J. E. Briggs  
Fan.....C. R. Brock et al  
Fare register.....J. F. Ohmer et al  
Feed lubricator. Automatic roller.....J. Fanning  
Feed roll.....G. A. Ensign  
Fence. Wire.....H. P. Ewell  
Fifth wheel.....A. Gustafson  
File case. Personal account.....L. M. Landing  
Filter.....C. P. Simmons  
Filter. Oil.....A. H. Franke  
Filtration apparatus for municipal or commercial uses.....J. P. Keane  
Fire shield.....L. C. Glisson  
Fire extinguishing attachment for cotton gin plants.....M. Swenson  
Firearm. Breech-loading.....A. H. Fox  
Fireproof ceiling.....G. Rader  
Fish line reel.....W. Horton  
Floor covering.....J. Sanders  
Floor unit.....E. Thacher  
Fly book.....W. R. Wheeler  
Fly trap.....J. Arnold  
Fork crown. Interchangeable.....H. Muller et al  
Friction spring.....P. Hien  
Furnace.....E. Ferraris  
Furnace cleaning door.....F. Fieberger  
Furnace grate.....W. E. Cole  
Furnaces. Gas valve apparatus for open hearth.....J. A. Sobolewski  
Furniture joint fastening.....J. E. Faught  
Game apparatus.....W. M. Stebbins  
Game apparatus.....D. H. Talbert  
Game register.....E. J. Wells et al  
Garment supporter.....C. W. Brown  
Gas burner tip.....E. Downey  
Gas engine.....J. Hirst  
Gas engine.....J. Lizotte  
Gas. Generating water.....H. Strache  
Gas generator. Acetylene.....W. S. May  
Gas or vapor engine.....F. G. Bates et al  
Gas producer.....J. Radcliffe  
Gate.....O. A. Morrow  
Gear. Changeable speed.....H. F. Jeffs  
Gear. Speed changing reversing.....F. H. Cheyne  
Gearing. Frictional.....E. Rawson  
Generator or mixing valve.....F. B. Widmayer et al  
Golf balls, &c. Composition of matter for the manufacture of.....C. O. Watkins  
Golf club.....H. K. Whitner  
Golf tees. Mold for forming.....O. A. Holbrook  
Grader. Road.....J. W. Macy  
Grain conveyer.....J. Vogt  
Grappling tool.....H. A. Worthington  
Gun breech mechanism.....G. Ehrhardt  
Gun breech mechanism.....C. Holmstrom  
Handle for spades, &c.....R. Parkes  
Harrow.....W. H. Patten  
Harrow tooth fastening.....G. E. Blaine  
Harvester. Potato.....E. L. Schanck  
Hat box.....J. A. Park  
Hat fastener.....W. P. Fraser  
Hat forming machine.....D. J. Brew et al  
Hat pin.....J. C. McDermott  
Hat tip.....J. R. & B. K. Myers  
Hats. Attachment for holding stock while pressing.....W. H. Kendall  
Hay rack or wagon.....A. Drechsler  
Hay rake and stacker.....A. H. Graves  
Hay tedder fork.....W. W. Shaw  
Headlight.....J. R. Stanton  
Headlight and illuminated sign for street cars, &c.....J. A. Duggan  
Heating furnace.....J. I. Dailey  
Heating furnace. Continuous.....H. B. A. Keiser  
Heating system hot air casing.....E. J. Mallen  
Helices, helical springs, flexible helical shafts, &c. Apparatus for the production of flat.....G. Trouve  
High potential windings. Means for preventing breakdown of.....W. S. Moody  
Hinge. Friction.....F. E. Sloan  
Hoisting apparatus.....3 pats.....C. W. Hunt  
Horse bandage. Race.....J. G. Haglock  
Horseshoe. Nailless.....P. Christiansson  
Horseshoe pad. Removable.....D. J. Cummings  
Hot air and hot water heater for house warming, &c. Combination.....D. C. Humphreys  
Hub. Wheel.....J. Krauss  
Hydrobenzaldehyde and making same.....G. Merling  
Hydrocarbon burner.....W. Macleod  
Hydrocarbon burner.....J. M. Wishart  
Impressing machine.....C. Carlton  
Incubator.....C. E. Adair  
Indigo vats. Preparing.....A. W. Playne  
Ink bottle holder.....E. G. Soltman  
Insecticides and fungicides to trees, &c. Machine for applying dust.....J. J. Kiser  
Interlocking board.....M. W. Wolfe  
Ironing machine.....C. Marck  
Jar closure.....J. M. Long, Jr  
Joint tightening device.....J. Brunau  
Journal box sand guard.....P. Martin  
Kerite.....W. R. Brixey  
Kerite. Manufacture of crude.....W. R. Brixey  
Kinetoscope. Projecting.....J. H. White  
Knife cleaning machine.....W. G. Kent & J. W. Sutton  
Knit fabrics. Mechanism for transversely severing webs of.....F. G. Shelau  
Knitting machine.....D. C. Bellis  
Knitting machine.....G. W. Ruth  
Lacing stud and eyelet. Combined.....G. L. Reensterna  
Ladder.....W. G. Siteman  
Ladder. Extensible.....M. Langen  
Ladder. Step.....P. F. Wynn  
Lamp. Carbureting.....O. D. Howell  
Lamp. Hydrocarbon vapor incandescent.....W. S. Proskey  
Lantern lighter.....F. C. Smith  
Latch. Gate.....P. J. Setbacken  
Lathe relieving attachment.....B. M. W. Hanson  
Lead sulfate into lead carbonate. Converting.....A. S. Ramage  
Leaf sheets. Means for extending and thickening.....A. O. & E. R. Kittredge  
Leather. Manufacture of artificial.....G. S. & C. Falkenstein  
Ledger. Separable.....J. F. Warne  
Level. Plumb.....O. F. Sinigar  
Life saving apparatus.....J. Strakele  
Liquid meter.....P. Samain  
Liquid separator. Centrifugal.....J. J. Berrigan  
Loom.....G. F. Hutchins & E. H. Ryon  
Loom shuttle.....J. Coldwell & C. G. Gildard  
Loom shuttle exchanging device.....C. & G. Brun, & J. Bicking  
Loom temple holding device.....J. A. Perkins & L. A. King  
Loom weft detecting device.....H. I. Harriman  
Lubricator.....A. E. Norris  
Magnesium sulfate. Making.....H. H. Wing  
Magnetic separator.....C. Scholl  
Match box.....P. Seiler  
Match safe.....W. W. Kyle  
Material of construction.....E. Thacher  
Measure alternating electric currents.....2 pats.....M. E. Thompson  
Metal drawing apparatus.....E. W. Vaughan  
Metal forming machine.....H. W. Forslund  
Metal. Treating scrap.....J. M. O'Connor  
Metals from complex or sulfid ores. Extracting.....J. C. Clancy & L. W. Marsland  
Metals from their ores. Obtaining.....N. S. Keith  
Mirror support.....M. V. Dunham  
Motors. Means for starting explosion.....J. W. Hinchley  
Motors. Means for synchronizing.....F. E. Case  
Motors. Starting induction.....A. Schwartz  
Motors. Synchronizing.....F. E. Case  
Mouth and nose guard.....M. B. Goodwin  
Mowing machine cutter.....A. Chanal  
Music box note sheet lifting mechanism.....G. A. Brachhausen  
Musical instrument. Self-playing.....J. Kruff  
Nut and bolt.....L. C. Amberson  
Nut lock.....J. H. Leonard  
Oil burner.....J. Fisher  
Oil burner.....G. F. Robertson  
Oil burner.....F. N. Wilcox  
Ole concentrator and dredging apparatus.....A. B. Stetson  
Ore roasting furnace.....A. C. Johnson  
Packaging machine.....W. H. Doble  
Paint and varnish and making same. Composition for removing.....C. Ellis  
Paper box. Metal lined.....G. Wolf  
Paper calendering machine.....A. Cameron  
Paper feeding machine.....G. R. Williams  
Parcel carrier.....E. M. A. Gimmig et al  
Pen. Drawing dotting.....J. Bossart-Bachli  
Phonographic sounder.....G. A. Moore  
Photographic timer.....E. Harrold  
Pianista.....A. Capra  
Pile driver.....J. M. Thomas  
Pipe bending apparatus.....W. W. Benson  
Pipe coupling.....J. M. Werth  
Pipes. Lining.....J. T. Hinds  
Pipe. Making butt weld.....P. Patterson  
Pipe union.....H. E. Marsh  
Planer.....E. Rawson  
Plastic compound.....S. B. Chroniger  
Playing ball.....3 pats.....E. Kempshall  
Plow attachment.....H. B. Murdock  
Plug and receptacle.....N. Marshall  
Pneumatic carrier system.....W. G. Davis  
Pole cap. Vehicle.....G. M. Davis  
Portable engine and sawing machine. Combined.....D. I. D. & G. B. Townsend  
Potato digger.....I. F. Tucker  
Power transmitting mechanism.....S. L. McCulloch  
Power transmitting mechanism.....M. Slotkin  
Press.....R. Birkholz  
Printing and ruling machines. Automatic feed for.....W. G. Johnston  
Printing apparatus.....W. G. Reynolds  
Printing decorative designs. Roller for.....B. J. Such  
Printing. Multicolor or polychromatic.....M. Rudometoff  
Printing press inking device.....G. H. Pierce  
Printing wheel.....O. N. Tevander  
Propeller. Duplex.....H. B. Allison  
Propelling apparatus. Convertible table.....J. Whiteside  
Pump governor valve. Automatic.....J. A. Baldwin  
Pumps. Shaft bearing for centrifugal.....J. Hedlund  
Pumping engine.....F. L. Orr  
Rack and pinion mechanism.....H. B. Azadian  
Rack mechanism.....H. John  
Radiator air valve.....F. W. Leuthesser  
Rail joint.....W. H. Fritz  
Rail joint.....K. Kohn  
Rail joint.....J. Wolfe  
Rail joint.....P. F. Berkey  
Rail joint.....C. O. H. Miller  
Rail joint.....J. Price  
Railway and car and magnetic appliance therefor.....A. C. Albertson  
Railway rail.....W. Leonard  
Railway rail bed.....J. Freund  
Railway signal.....W. H. Walton  
Railway system. Electric.....W. Robinson  
Railway track appliance.....H. T. Porter  
Railway trains. System for computing the resistance of.....J. M. Daly  
Railway trains. System for computing tonnage resistance.....J. M. Daly  
Ram. Hydraulic.....J. A. Snively  
Refrigerating, &c. Apparatus for producing cold air for.....T. & W. L. Cole  
Register.....H. R. Richardson  
Kennet. Composition of matter for use with retaining apparatus.....H. Small  
Retort discharging apparatus.....L. Bertrand  
Revolver front sight.....D. B. Wesson  
Rheostat.....F. Mackintosh  
Ribbon retainer.....F. C. Steinkamp  
Road bed.....G. A. Le Fevre  
Rocker. Platform.....W. P. Seng  
Roller table. Power driven.....O. Sundt  
Rotary engine.....E. C. Warren  
Rotary steam motor.....H. Roeske  
Rudder. Yacht.....G. W. Swan  
Rule and square. Combined.....P. M. Callahan  
Saddle. Harness.....J. J. Creedon  
Sanding machine.....2 pats.....E. B. Hayes  
Sash balance and fastener.....F. J. Lowery, et al  
Sawing machine attachment.....J. N. Graham  
Saw mill feed works.....S. Edwards  
Scaffold horse.....J. S. Tilley  
Scale. Computing.....W. F. Stimson  
Scraper. Wheeled dumping.....V. D. Johnson  
Screen hanger and lock.....B. F. Douglass  
Screw machine.....F. E. Wells  
Seat.....F. B. Redington  
Sensitized plates. Light proof case for.....A. A. Brooks, et al  
Settling tank or decanting vessel.....J. Randall  
Sewage. Apparatus for use in the treatment of.....H. B. Killon



Shade bracket. Window..... J. C. Barker  
Shade hanger. Window..... S. Johnson  
Shaping tools of different patterns. Pattern-grinding apparatus for..... C. Kremnitz  
Sheet metal can..... F. W. Galbraith, Jr  
Ships, &c., for making them less visible. Treating the outsides of..... G. Brush, et al  
Shoe protector..... J. A. Kaiser  
Shoe upper packing machine..... M. E. Morris  
Shovel handle. Auxiliary..... J. C. H. Gruner  
Show case..... W. G. Flint  
Shutter worker..... A. L. Champion  
Signal waves. Amplifying electromagnetic..... 2 pats. J. S. Stone  
Signaling. Apparatus for selective electric..... 2 pats. J. S. Stone  
Signaling by electromagnetic waves. Selective..... R. A. Fessenden  
Signaling. Selective electric..... J. S. Stone  
Sink cleaning device..... W. Melvin  
Skirt supporter..... E. U. Lloyd, et al  
Smokers' articles. Manufacturing..... G. L. Flusin  
Snap hook..... C. A. Buck  
Socket wrench. Adjustable..... J. C. Burgess  
Soda alum. Making..... J. F. White  
Soldering iron..... C. A. Kaiser  
Sole for boots or shoes. Spiked..... G. L. Pierce  
Sound box for recording or reproducing apparatus..... E. Berliner et al  
Speed measurer for rotary shafts..... J. Heyde  
Spinning and doubling apparatus..... R. W. Moncrieff  
Spinning ring..... M. E. Sullivan  
Spiral shaped helically twisted bodies. Manufacture of..... J. C. Blair  
Spitton. Fountain..... J. C. Blair  
Spitton. Street-car..... R. B. Norwood  
Spoke socket..... W. B. Roberts  
Springwork clip..... J. A. Staples  
Stacker..... G. W. Worley  
Stacker. Wind..... C. Hearn  
Stall floor..... J. W. Combs  
Stapler puller..... F. T. King  
Stationery package box..... J. P. Norton  
Steam engine..... C. Vogel  
Steam explosive engine..... C. A. Braden  
Steam roller..... G. E. Townsend  
Steel in conical ingot molds. Press for compressing liquid..... H. Harmet  
Steering gear..... G. A. Burwell  
Stiffening strip for garment waists, corsets, &c..... A. M. Weber  
Stoker. Mechanical..... J. W. Kincaid  
Stove. Hot-blast..... R. Young  
Sugar manufacture centrifugal action. Treating masse-cuite of..... H. Claassen  
Suit-hanger..... L. G. Swan  
Swiveled chair..... E. G. Watkins  
Syringe. Extracting..... J. R. Perry  
Table..... W. T. Wells  
Table..... F. A. Greenlaw et al  
Tanning skins or hides..... A. J. Pilar  
Target trap. Magazine repeating..... W. D. Troutner  
Telephone. Pay..... C. E. Egan  
Telephone system..... A. F. Swan  
Telephone system signal bell..... C. E. Egan  
Telephone transmitter arm joint..... C. T. Mason  
Thermometer..... A. T. Le Vesconte  
Thresher..... W. A. Hesse  
Thresher tooth fastener..... W. W. Jones  
Tickets to goods. Hand machine for attaching..... H. G. Davis  
Tile. Ornamental..... R. Wagner  
Time ball apparatus..... A. L. Woodworth  
Time recorder. Workman's..... J. J. Stockall, Jr  
Tires. Automatic pump for pneumatic..... C. S. Langton  
Tobacco baler..... H. W. Helgeson  
Tobacco leaf cutting knife..... C. Millhiser  
Tonnage resistance indicator..... J. M. Daly  
Tonnage resistance indicator. Graphic..... J. M. Daly  
Tool holder..... J. M. Normand  
Toothpick..... J. E. Hills  
Toy figure..... F. K. T. Meinecke  
Toy. Musical pipe..... H. E. F. Westenfeld  
Toy target and gun apparatus..... W. A. Zech  
Traction increasing device. Electromagnetic..... A. A. Honey  
Transformer and means for winding same..... E. R. Gill  
Tray. Serving..... S. Peete  
Trolley catcher..... E. M. Zwing  
Trolley harp..... H. S. Doyle  
Trolley protector. Electric..... W. W. Hoffman et al  
Truck. Car..... 2 pats. E. Cliff  
Truck. Passenger car..... E. Cliff  
Tunnel. Ventilating..... W. Moran  
Upholstery spring support..... C. Bush  
Valve..... C. O. Rowley  
Valve..... W. Meredith  
Valve. Alarm..... P. Evans  
Valve. Balanced..... J. Mitchell et al  
Valve gear. Explosive engine..... W. J. Robb  
Valve. Hydraulic or other fluid controlling..... H. S. B. Brindley  
Vegetable cutter..... N. Lyke  
Vehicle attachment..... W. W. Mette  
Vehicle frame..... H. Mette  
Vehicle steering mechanism..... J. F. Duryea  
Vehicle steering mechanism. Trail..... W. F. MacGregor  
Vehicle wrench..... W. Lee  
Ventilating apparatus..... H. Kroder  
Ventilator..... J. O. Stanley  
Vessels. Storage of supplies for submarine..... S. Lake  
Vest..... E. R. Wood  
Violin muting device..... E. Barginde  
Wainscoting or the like..... W. S. Satterfield  
Wall bracket. Adjustable..... G. Holtz  
Warp beam attachment..... A. Tourtellier  
Warp threads. Mechanism for uniting the ends of..... G. Hiller  
Watch guard..... F. A. Adams  
Watches. Tool or truing balance-wheels of..... R. D. Nelson  
Water in the earth. Electrical process of locating running..... F. H. Brown  
Water purifier..... G. M. Davidson  
Water purifying apparatus..... L. Gathmann  
Water tube boiler..... 3 pats. J. C. Cooks  
Wax ends. Tool for twisting..... E. Kiss  
Well drill..... P. H. Boothe et al  
Wells. Shutting off water in drilled oil..... W. Plotts  
Wheel fastening. Divided..... C. W. Shartle  
Whiffletree hook..... L. A. Beeman

Winding machine. Cop..... W. T. Hanson  
Window..... P. Brown  
Window fastener. Automatic..... A. H. H. Sieffert  
Window screen..... F. B. Harrison  
Wire tightener..... J. W. Headley  
Woodworking implement..... F. Streich  
Wrench..... J. J. Quinlan  
Wrench..... J. L. Young  
Wrench..... G. D. Cleveland  
Zinc sulfid ores. Treating..... J. C. Clancy et al

## DESIGNS.

Andiron..... C. D. Shepard  
Sewing machine cabinet..... W. C. Free

Issued December 9, 1902.

## MECHANICAL PATENTS.

Accumulator..... F. N. Blanc  
Aeration of liquids. 2 pats. F. G. Hampson et al  
Air brake for railways. Compressed..... L. Kirchner  
Air pressure. Apparatus for alternating..... H. F. Garey  
Ale. Apparatus for carbonating and dispensing ginger..... A. R. Phillips  
Alkaline salts of methylene citric acid and making same..... R. Berendes  
Aluminium or other metals by electrolysis. Obtaining metallic..... G. Taddei  
Amalgamator..... W. F. Bedell  
Amado compounds of the fatty series and producing same. Aromatic derivative of..... G. W. Meiser  
Anode..... F. McDonald  
Automobile crane..... M. W. Kouns  
Automobile running gear..... C. E. Neal  
Awning..... J. C. McNamra  
Awning locking mechanism..... L. A. Daus  
Axle cap..... F. T. Giles  
Baling press..... R. McBride  
Ballast rammer..... A. Collet  
Banjo..... V. Kraske  
Barrel washer..... F. Aue  
Basin support. Wash..... L. M. Hooper  
Beaches. Means for forming..... F. W. Cushing  
Bearing. Sheave..... T. R. Ferrall  
Bed lounge..... H. Hagedorn  
Bed or seat bottoms. Spring structure for..... L. H. Lawhon  
Beer, &c. Metallic storage vessel for..... V. Lapp  
Bell. Electrical call..... W. E. McCormick  
Berry picker..... P. H. Emley  
Blast furnace..... R. C. Steese et al  
Blower. Steam..... E. Gibson  
Bobbin carrier..... G. H. Miller  
Boiler..... R. B. Hobson  
Boiler front..... R. Eisenmann  
Boiler setting. Steam..... E. Gibson  
Bolster..... A. Pancoast  
Book. Triplicate order..... A. V. Neumann  
Bookbinding machine..... W. E. Blauvelt  
Bookcase. Sectional..... P. W. Casler  
Booster system..... G. Baehr  
Boot or shoe upper fastener..... W. E. Sweeney  
Bottle..... L. Lesser  
Bottle capping machine..... H. G. Davis  
Bottle illuminating machine..... J. H. Koehler  
Bottle. Non-refillable..... E. Kersey  
Bottle stopper for preventing the refilling of bottles..... W. G. Christian et al  
Box and drawer..... S. Lynn  
Box blank pasting and folding machine..... E. G. Staude  
Brake shoe..... W. O. Belt  
Brake shoe..... T. E. Twist  
Brick drier..... J. Starkey  
Broiler..... R. P. Smith  
Brush. Tooth..... A. Haussmann  
Buckle. Trace..... C. C. Schwaner  
Burner or like burner..... W. Schaefer  
Burner..... H. B. Cary  
Burning liquid fuel..... H. B. Cary  
Camera plate attachment..... J. A. Smith  
Can opener..... E. N. Manzer  
Can testing machine..... N. B. Wachhorst et al  
Cane. Portable cradle for hauling and handling sugar..... W. C. Gregg  
Caps permanently with vessels. Means for securing closing..... A. A. Low  
Car bolster..... A. Paucoast  
Car brake. Hand..... R. N. Edwards  
Car dump..... W. A. Lathrop  
Car. Dumping..... J. J. Souder  
Car fender. Street..... J. Nosek  
Car. Freight..... M. A. Dees  
Car. Freight..... H. A. Johnston  
Car rocker side bearing. Railway..... J. J. Hennessey  
Car sign and means for operating same. Illuminated..... H. F. Bristol  
Carbureter. Explosive engine..... A. A. Longuemare  
Card holder..... A. S. Anderson  
Carpet lining..... W. A. Mauran  
Carpet raveling machine..... G. W. Heath  
Carpet stretcher..... F. Lenzner  
Carriage steering gear. Motor..... H. A. Schryver et al  
Cart. Dumping..... A. Laporte  
Cash register..... J. F. Woodson et al  
Casting point..... C. Lindstrom  
Caster..... E. W. Wainwright  
Casting apparatus..... H. G. Underwood  
Centering gage..... I. A. White  
Centrifugal mill..... O. Gaiser  
Chain. Drive..... J. M. Dodge  
Chair..... J. E. Gilson  
Chair..... A. Brubaker  
Chair foot rest..... J. S. Kenny  
Charcoal furnace. Fire clay..... C. J. Koch  
Chuck..... F. A. Errington  
Chuck. Friction drill..... C. C. Roberts  
Chuck. Planer..... S. E. Walling  
Cigar band..... M. Regensburg  
Cigar cutter..... R. Steinecke  
Cistern, tank, or reservoir cleaner..... T. S. Murray et al  
Clasp..... F. E. Schencker et al  
Cloth. Clamping device for cutting..... A. W. Curtis  
Clutch mechanism..... E. M. Couch  
Clutch mechanism. Reversible..... W. J. Wright  
Coin counter..... J. W. Davis  
Coin holder..... C. W. McCarter  
Coin receptacle safety device..... A. C. Rogers  
Collar. Horse..... B. Allen, Jr

Computing machine..... J. M. Daly  
Computing machine. Gravity..... J. M. Daly  
Conveyer..... J. H. Hahn  
Conveyer..... F. R. Willson, Jr  
Conveyer shaft hanger..... F. R. Willson, Jr  
Conveying apparatus..... F. R. French  
Cooling apparatus..... J. E. Haarmann  
Copper or copper alloys. Manufacture of various articles from..... G. A. Dick  
Corset..... J. Bowers  
Corset stiffeners. Machine for making..... J. H. Holden et al  
Cotton gin feeder and cleaner..... J. W. Seifert  
Coupling for tenders, &c..... W. Wright  
Cream separator..... C. E. Potts  
Cream separator liner. Centrifugal..... C. J. Lundstrom  
Cross tie cutting machine..... C. A. Hege  
Cultivator. Lister..... C. A. Brostrom  
Curling iron heater..... C. S. Burrington  
Curtain fixture..... F. Hofmann  
Curtain pole. Lace..... J. R. Stilwell  
Currents. Generating alternating..... C. S. Bradley  
Cutter or tool gage..... J. P. Hayes  
Dental plugger..... J. D. Wilkens  
Dentistry. Mechanical..... H. A. Littig  
Diaphragm meter and exerciser..... J. E. Ruebsam  
Dipping tank..... J. Muller  
Dish cutting machine..... L. W. Tinkham  
Display rack..... J. L. Kragle  
Door hanger..... J. Handschumacher  
Drag rake..... H. Bormann  
Drawer attachment..... J. T. Moyer  
Drawing. Apparatus for facilitating..... F. Aborn  
Dress shields. Making..... T. Davis  
Drill..... G. W. Griffiths  
Drill bit..... A. S. Jones  
Dust guard..... E. Harris  
Dye and making same. Anthracene..... M. H. Isler  
Dyeing apparatus..... J. A. Willard  
Elastic goods. Manufacturing molded..... F. Daubitz et al  
Electric battery. Gravity..... A. M. Friend  
Electric conducting cables. Forming..... R. Spaulding  
Electric elevator..... H. Rowntree  
Electric furnace..... 3 pats. H. N. Potter  
Electric furnace. Tubular..... H. N. Potter  
Electric motors. Reversing switch controller for..... J. I. Ayer  
Electric roller..... C. J. Marius  
Electrical controller..... J. L. Schureman, Jr  
Electrical switch..... C. D. Platt  
Electrical transmission. Composite system of..... F. Bedell  
Electrode. Accumulator..... R. Alexander-Katz  
Electrolytic apparatus..... J. Matthews et al  
Electromagnetic..... A. Stromberg  
Electrotype base..... J. W. Cornelius  
Elevating and controlling mechanism..... J. F. Hardy  
Elevator..... F. T. Ellithorpe  
Engine..... W. F. Tosch  
Engine structure. Compound..... L. D. Lovelock  
Eraser..... R. J. Driskoll  
Eraser cleaner..... F. W. & W. A. E. Stutt  
Eyeglass or spectacle case..... J. G. Koenen  
Fastening device..... B. F. Sutton  
Fastening device for articles of women's wear..... I. H. Sessions  
Faucet..... L. C. Glisson  
Faucet..... 2 pats. J. Stretch et al  
Faucet and hose connector..... J. Blumer  
Feed water heater and purifier..... W. A. Gibson  
Feeding and scale removing device for steam boilers. Water..... J. M. Hegarth  
Feeding device. Stock..... L. Helmick  
Fence. Woven wire..... R. H. Bloomer  
Fertilizer distributor and planter..... J. B. Crowder  
File box..... F. Trambly  
Filter..... J. Kostulek  
Filter. Cistern..... J. W. Craine  
Firearm single trigger mechanism..... C. F. Lefever  
Fire engine..... P. H. Dedrick  
Fire escape..... C. B. Smith  
Fire escape..... P. Zimmer  
Fire escape..... W. H. Porter, Jr  
Fish hook..... P. T. Berthold  
Fish jar or aquarium..... F. R. Gillinder  
Fishing reel..... J. Konigsberg  
Fluid motor. Expansive..... J. A. Norton  
Fluid pressure engine..... H. Romanski  
Flush tank float rod..... O. H. Jones  
Fly escape. Screen..... J. J. Travis  
Folding box..... W. Van Horn  
Folding chair..... G. J. Kelley  
Folding chair..... S. R. Rodgers  
Foot shield..... W. E. Bosworth  
Frame and calendar..... F. E. Housh  
Fumigator and refrigerator. Combined..... G. E. Alphin  
Furnace..... R. S. Franz  
Furnace and air feeding apparatus therefor..... E. Maslin et al  
Furnaces. Drying air for blast..... J. Gayley  
Furnaces. End support and circuit terminal far carbon tube..... H. N. Potter  
Furnaces. Operating melting..... W. W. Lobdell  
Fuse box..... M. R. Utley  
Game apparatus..... E. H. Dunbar  
Game board..... U. H. W. Schenck  
Garment fastening..... L. B. Gaylor  
Garment fastening..... S. J. Cox et al  
Garment. Protective..... K. M. Davis  
Garment rack..... C. Doubat  
Garment supporter..... J. H. & I. Taylor  
Garments, &c. Fastener for..... J. L. Dinkelspiel  
Gas. Generating producer..... M. V. Smith  
Gas meter..... J. R. Dupoy  
Gas producer..... M. V. Smith  
Gaseous fuel burner..... O. Falkenwalde  
Gate attachment..... G. W. Peek  
Gin saw filing machine..... A. Fredrickson  
Glass cutting device..... W. Pannkoke  
Gloves, &c. Fastener for..... J. L. Dinkelspiel  
Governor stop. Automatic..... W. G. Kachel  
Grain elevator and transmitter..... W. S. Sharpneck  
Grain. Steeping..... W. P. Rice  
Grinding mill..... J. H. Pendleton  
Hammering tool. Portable automatic..... F. M. Leavitt  
Harness appliance..... W. D. Beideman et al  
Harness. Traceless..... H. W. & M. B. Dewey  
Harvester or mower cutter bar..... I. N. Graham

Harvester machine. Corn..... J. W. Fridmore et al  
Hat fastener..... J. Pomeroy  
Hay rake and loader. Combined..... D. N. Schubert  
Heating apparatus. Steam..... W. Webster  
Heating system..... L. J. M. Rouquaud  
Hitching device. Horse..... D. R. Udell  
Hitching post..... A. S. Hill  
Hoist. Telescopic..... F. C. Weber  
Hoisting or other machines. Load brake mechanism for..... H. Sawyer  
Hook and eye..... W. J. Morgan et al  
Hop handling and drying apparatus..... D. Wieting  
Horizontal bar..... T. Wallace  
Horseshoe..... F. Kaczynski  
Hose bridge wagon..... R. Filainger, Jr  
Hose coupling..... J. Stifter, Jr  
Hose coupling..... H. T. Cronk  
Hose supporter..... M. H. Eisenman  
Hydrocarbon burner..... H. B. Cary  
Hydrocarbon burner..... A. F. Chace  
Hydraulic press..... O. Philipp  
Hypodermic needle cleaning device..... G. Porter  
Hydrostatic presses. Regulating means for..... A. W. French  
Injector burner..... E. Reagan  
Insect screen..... A. A. Frankel  
Insulator..... M. Harloe  
Jack-o'-lantern..... A. B. Herd  
Jar closure..... H. S. Brewington  
Knit goods. Tubular..... W. W. Burson  
Knob. Curtain..... H. Higgins  
Label holding cabinet..... D. O. Cowles  
Lace. Shoe..... E. L. Pitts  
Lamp burner..... B. F. Fowler  
Lamp carbon guide. Electric..... W. J. Deming  
Lamp protector. Electric..... F. B. Garreston  
Last..... G. W. French  
Lathes. Pivot grinding attachment for jewelers'..... J. E. & W. R. Jackson  
Lead and zinc fumes. Refining..... F. L. Bartlett  
Life preserver..... J. B. Hamilton  
Lift safety door..... J. Davies  
Light effects. System of and apparatus for controlling..... R. F. Spangenberg  
Lining. Waist..... M. E. de Latour  
Liquid receptacle stand..... E. M. Paine  
Liquids from the bottoms of casks. Device for drawing off..... G. H. Pabst  
Liquors at high pressure and at various degrees of temperature. Apparatus for dispensing..... S. H. Atchison  
Locomotive steam boiler..... W. J. Thomas et al  
Loom shuttle motion..... J. Poyser  
Looms by the quantity of weft in the shuttles. Mechanism for controlling..... J. H. Klerx  
Lubricator..... G. Whitaker  
Magnet coil. Ventilated..... W. Spencer, Jr  
Mail bag fastener..... C. A. & F. L. Merrill  
Mail box..... S. M. Birely  
Malt drying apparatus..... W. P. Rice  
Malting drum..... J. F. Dornfeld  
Massage apparatus. Electrical..... O. A. En Holm  
Match making machine..... H. C. La Flamboy  
Mattress filling machine..... A. Wuest, Jr  
Meat tenderer..... F. M. Robinson  
Merchandise transfer apparatus..... 2 pats. A. W. Swanitz  
Mercantile stock register..... E. A. Weigley  
Metals for electrolysis. Apparatus for obtaining..... G. Taddei  
Milk cooler..... A. H. Reid  
Molding apparatus..... J. C. Reed  
Motor..... J. G. Hudspeth  
Motor engine..... D. A. Decrow  
Mower grass receptacle. Lawn..... L. Wildermuth  
Mower. Lawn..... F. L. Adams  
Multiple cylinder engine..... L. C. Worren et al  
Musical instrument..... D. H. Haywood  
Musical instrument. Automatic..... E. de Kleist  
Musical instrument players. Tracker board for automatic..... E. M. Skinner  
Napkin holder..... L. J. Martin  
Nippers..... G. A. Lowry  
Nut finishing machine..... 4 pats. O. Tyberg  
Nut lock..... W. E. Karns  
Nut lock..... O. C. Moore  
Oil burner..... W. D. Dawson  
Oil burner asphaltum collector..... G. W. Arper  
Ordnance..... J. Kurig  
Ordnance recoil check..... G. A. Loeben  
Ore concentrator..... G. E. Woodbury  
Organ. Reed..... P. C. Preston  
Packing for piston rods. Metallic..... F. E. Small  
Packing. Piston rod..... W. S. Jarboe  
Packing pulverulent and mastic substances. Machine for..... V. G. Apple  
Paper bag machine..... C. E. Dublin  
Paper, &c. Machinery for cutting and folding..... R. C. Seymour  
Paper receptacle..... E. B. Hay  
Paper trimming and pasting machine..... A. C. Luke  
Pavements or roadways. Preparing the ingredients of street sheet..... F. J. Warren  
Peat fuel. Manufacturing..... R. A. Kellond  
Pen. Fountain..... R. B. Dickie  
Pencil holder..... J. R. Booth  
Pencil sharpener, ink eraser, and paper cutter..... H. Pease  
Pencil sharpening apparatus..... F. Mossberg  
Photograph holder..... N. E. Harper  
Photographic film holder..... W. H. Hamersly  
Photographic plate developing apparatus..... J. G. Schodron  
Photographic plate holder..... I. L. Green  
Pile fabric. Woven..... R. R. Tweed et al  
Pilot house indicator for steamboats, &c..... J. N. Wainman  
Pin bender..... F. L. Lemou  
Pipe joint. Metallic and earthenware..... G. F. Ryan  
Pipe union. Swiveled valve..... G. H. Schamp  
Pivot joint for tobacco stalk cutters, pruning shears, &c..... J. S. Kaufman  
Plating machine..... W. J. Finch et al  
Plane..... L. M. Curry  
Planters. Means for manipulating marker base of..... W. H. Glosser et al  
Planting machine. Corn..... A. Lindgren  
Playing ball..... F. H. Richards  
Pleasure device..... A. Kiddie  
Plow..... E. L. Gillham  
Plow..... G. M. McLaughlin  
Plow. Beet harvesting..... I. L. Umstead



Plow, Wheel..... I. A. Weaver  
Pocket book clasp..... C. J. Gustafson  
Poles, &c. Tool for peeling..... H. Hansson  
Post hole digger..... A. B. Griffin  
Potato bug destroyer..... M. W. Pomraning  
Preservative box..... M. Kohn  
Printer's chase..... F. A. McGuire  
Printing press make-readies or overlays. Preparing..... M. Dethleffs  
Printing presses, &c. Stop motion for..... G. R. Williams  
Propeller controlling device for submarine boats..... S. Lake  
Pulley block..... L. E. Laurent et al  
Pulley, Split..... J. W. Berry  
Pulleys. Construction of driving or similar..... G. L. Scott et al  
Pump, Oil well..... A. B. Gahagan  
Pumps. Motive power for operating systems of..... D. D. Shaw  
Pumping and fluid actuated machine. Fluid..... W. C. Vandegrift  
Pyrographic tool..... H. Wilcox  
Rail bonding machine..... L. N. Farnum  
Rail chair and insulator..... W. D. Young  
Rail joint..... F. Burger et al  
Rail joint..... G. Hirschell  
Rail joint..... R. E. Van Naular  
Rail joint tie. Keyway..... F. P. Saleme  
Railway brake beam..... T. H. Simpson  
Railway-rail joining device..... E. G. Baker  
Rake..... W. S. Richards  
Ratchet drill..... J. Petterson  
Receptacles. Connecting apparatus for rotary..... O. H. & W. M. Jewell  
Reclining chair..... J. S. Kenny  
Rheostat..... F. C. Watson  
Ribbon feeding mechanism..... R. Burk  
Rivet calking tool..... P. J. Sweeney  
Riveting machine..... L. P. Taage  
Roll, Yielding..... B. F. Coukle  
Rope operating apparatus..... C. A. Baechtold et al  
Rotary engine..... F. E. Womer  
Sad iron holder..... K. Barnickol  
Safe lock. Electric..... J. M. Allen  
Sash fastener and lift..... J. W. G. Alford et al  
Scaffold support..... W. J. Le Bret  
Sealing device. Can..... A. W. Livingston  
Seam dampener..... W. H. Rickey  
Seed drill and fertilizer distributor. Combined..... F. Bateman  
Sewing machine. Boot or shoe..... J. H. & J. B. Ursbruck  
Sewing machine hemming attachment..... W. E. Durham  
Sewing machine presser foot lifting and locking mechanism..... H. A. Klemm  
Sewing machine. Waxed thread..... P. Shatford  
Shade. Window..... M. E. Reilly  
Shaft. Flexible..... J. A. De Vito  
Shear spring..... R. G. Titus  
Shears and punch. Combined..... W. F. Custer  
Sheep shears..... C. J. Shipway et al  
Shock carrier..... E. A. Johnston  
Sign..... F. E. Smith et al  
Sign. Electric..... L. S. Crandall  
Slat and wire fabric making machine..... J. Reif, Jr  
Sled. Hand..... J. Mauser  
Smelting furnace. Iron..... H. A. Jones  
Snap. Harness..... A. C. Getz et al  
Snap switch..... H. E. Reeve  
Sound conducting horn..... G. A. Baldwin  
Spectacle frame..... J. C. Anderson  
Spindle adjusting device..... O. Tyberg  
Spool. Sheet metal jack..... J. E. Zimmermann  
Square. Adjustable..... L. S. Starratt  
Square bevel attachment..... J. Simpson  
Square. Try..... H. B. Cary  
Stack protector. Adjustable..... A. Quarrie et al  
Stacker for threshing machines. Pneumatic straw..... R. & T. B. Christie  
Stalk cutter..... J. T. Kizer  
Starching machine..... W. H. Rickey  
Steam pressure indicator..... E. A. Hitchcock  
Steam separator..... G. Engel  
Steam shovel..... F. Franz  
Stirrup..... P. W. Koontz  
Stirrup. Riding..... E. E. Dunnegan  
Stone post. Artificial..... H. D. Streator  
Storage battery..... 2 pats..... L. Paget  
Stove grate..... C. A. Neff  
Stove hot water reservoir..... W. J. Keep  
Stoves, &c. Fire pot for..... C. S. Prizer  
Street sweeper..... J. T. Collins  
Structure brace..... E. Kidwell  
Stump puller..... S. H. Pickett  
Sugar. Means for preserving maple..... A. Low  
Suturing instrument..... D. Schisgal  
Tap or die. Collapsible..... P. Krastin  
Teeter totter. Automatic revolving..... G. R. Unkefer et al  
Telegraph..... J. E. Carney  
Telegraph. Electric..... T. D. Penniman  
Telegraphic distribution system..... H. A. Rowland  
Telephone transmitter sanitary attachment..... H. Baethig  
Test indicator..... F. B. Jacobs et al  
Theater appliance..... A. M. Zinn  
Thermo electric pile..... A. Heil  
Thill support..... D. W. Thoma  
Thill. Vehicle..... W. H. Schultz  
Threshing machine band cutter and feeder..... G. W. Parsons  
Threshing machine band cutter and feeder..... A. Vanhouweling  
Tire. Detachable pneumatic..... F. A. Seiterling  
Tire for vehicles. Elastic..... H. H. Durr  
Tire. Pneumatic..... E. H. Seddon  
Tobacco, &c. Machine for packeting..... E. Belot  
Tobacco stripping machine..... 2 pats..... F. G. Frankenberg  
Tooth. Artificial..... M. I. Rubin  
Top roll saddle..... T. E. Norman  
Toy fountain..... H. P. Attwater  
Toy pistol..... C. A. Bailey  
Track sanding apparatus for electric or similar cars..... I. S. Lang  
Traction engine..... H. C. Jones  
Tramway. Wire rope..... A. Painter  
Tree trunks. Removing cores from..... H. B. Ayres  
Trolley. Electric railway car..... L. E. Watkins  
Trolley wire hanger. Electric..... A. Palmros  
Truck. Car..... R. E. Powers  
Truck. Car..... B. W. Tucker  
Truss..... J. U. Adams  
Truss..... M. B. Smyth  
Tube compressor..... G. J. Seabury  
Tube covering die..... P. H. Friel  
Tunnel..... H. Moeser  
Tunnel roof..... J. C. Meem

Tunneling shield. Pneumatic..... T. Cooper  
Turbine engine..... J. H. K. McCollum  
Turbine governor. Elastic fluid..... C. G. Curtis  
Turpentine box..... E. L. Vickers  
Type casting and composing machines. Omitting means for automatic..... W. Ackerman  
Vaccinating tool..... E. M. Houghton  
Valve..... 2 pats..... W. Heston  
Valve. Balanced automatic safety..... H. P. Tippet  
Valve. Flushing..... S. W. Lewis  
Valve for water heaters. Automatic..... D. S. Cole  
Valve. Safety..... H. P. Tippet  
Valve. Tank..... D. M. Wright  
Vehicle driving mechanism..... L. G. Nilson  
Vehicle spring. Pneumatic..... W. C. Wood  
Vehicles. System of control for electrically propelled..... W. B. Potter  
Vehicles. Variable speed gear for..... F. Markgraf  
Vending machine..... F. J. Beier  
Vine cutter. Fertilizing..... J. M. Barnes  
Washing machine..... J. N. Uri  
Washing machine. Clothes..... O. E. Michaud  
Water closet flushing device..... F. Adee  
Water cooler..... A. N. Rose  
Water trap. Exhaust..... J. W. Newman  
Weather strip..... M. B. Stanfield  
Welded cast metal process..... W. Kent  
Wheel..... F. Lyon  
Whip. Drover's..... P. S. Harrington  
Window lock..... T. Choje  
Window screen and slide..... C. L. Taylor  
Wood or iron poles and timbers. Preserving..... H. Etheridge  
Woodworking machine..... C. Sterba et al  
Wound closing device..... G. J. Van Schott  
Wringer bench and ironing board. Combined..... G. W. Underwood

## DESIGNS.

Belt..... 2 pats..... M. H. Eiseman  
Brooch or similar article..... W. C. Bowlen  
Buckle member. Belt..... A. J. Howie  
Coffee pot or similar article..... A. F. Jackson  
Pillow top..... E. D. Morrison  
Platter or similar article..... A. F. Jackson  
Poker chip..... S. A. Cohen  
Silverware border or mount..... A. F. Jackson  
Stove..... 3 pats..... E. C. Warren  
Stove. Cook..... W. L. Mersfelder  
Stove. Heating..... T. R. Kennedy et al  
Stove. Heating..... W. L. Mersfelder  
Teapot or similar article..... S. G. Wilkes

Issued December 16, 1902.

## MECHANICAL PATENTS.

Acid from galvanizing works. Treatment of spent..... H. E. Howard et al  
Acid. Making acetic..... P. Boessneck  
Advertising device..... J. F. Smiley  
Air and gas mixer..... C. W. Hinman  
Air brake and slack adjusting mechanism. Combined..... J. M. Craig et al  
Amusement apparatus..... J. St. Clair  
Anchor hoisting device for submarine boats..... S. Lake  
Angle bending machine..... I. H. Dillon  
Animal trap..... J. E. Manlove  
Animal trap..... S. R. Leonard  
Applicator..... W. C. Holt  
Atomizer. Lubricant..... C. C. Baldwin  
Automobile..... J. Ledwinka  
Automobile steering column..... H. B. Brazier  
Awning raising device..... J. A. McGuigan, Jr  
Awnings, &c. Hanger for..... W. K. Farrand  
Axle. Vehicle..... M. B. Lloyd  
Baby tender and walker..... C. J. Carroll  
Bale and tie. Combined..... W. M. Holmes  
Band cutter and feeder..... H. J. Fourtner  
Banner. Motto..... W. B. Shuck  
Basket or fruit box. Folding..... O. Hoffmann  
Bathing pan. Portable..... E. Pierce  
Bean assorting machine..... M. W. Gunn  
Bearing. Ball..... T. & J. Fraser  
Bearing. Hub..... E. Christman  
Bed bottom support..... T. Klipfel  
Bed bottom support. Elastic..... T. Klipfel  
Bed. Folding..... M. Geisel  
Belt stretcher..... D. R. Davis  
Bicycle brake..... H. W. Lapsley  
Bicycle gearing..... F. Steinkamp  
Binder. Temporary..... F. W. Reindel  
Boilers. Means for supplying water to..... J. G. Sutherland et al  
Bolt fastening device. Expandable..... C. L. Peirce, Jr  
Books, &c. Cutting attachment for check..... G. G. Ritchie  
Books, &c. Holder for..... S. Stedeker  
Boot or shoe counter stiffener..... W. B. Johnson  
Boots, &c. Fastener for..... C. A. Penning  
Bottle holder. Fruit..... J. G. Harrington  
Bottle. Non refillable..... E. P. Sawtelle  
Bottle. Non refillable..... J. S. Candee  
Bottle stopper..... C. Dorn  
Bottle stopper..... A. & P. Schroeder  
Bottle stopper..... J. A. Alsfasser  
Bottle stopper..... G. W. Lunt  
Box cover support..... S. B. Evans  
Box elevator..... F. V. Hetzel  
Brake..... L. Melanowski  
Brake..... C. Carloni  
Brake beam..... 3 pats..... S. A. Crone  
Brake shoe head. Adjustable..... C. F. Uebelacker  
Branding iron. Self heating..... A. A. Phipps  
Brick trimming machine..... T. M. Walker et al  
Bridge..... J. C. Williams  
Broom holder..... F. Scott  
Broom or brush. Sweeping..... D. W. Winstanley  
Brush..... A. W. Engel  
Brush. Electric..... R. D. Laughlin  
Brush. Fountain shaving..... T. H. Scott  
Bucket dumping apparatus..... W. R. Wilcox  
Buckle..... J. Beveridge  
Building construction..... S. Giletti  
Bushing for buffing wheels..... J. T. White  
Button fastening for garments..... G. W. McGill  
Buttonhole cutter..... A. Jude  
Calcium carbophosphid..... C. S. Bradley et al  
Calendar..... A. Anderson  
Calipers. Wood..... C. F. Osborn  
Cam..... V. W. Mason, Jr  
Camera fronts. Adjusting mechanism for photographic..... J. A. Robertson et al  
Camera. Photographic..... L. J. R. Holst  
Camera. Photographic..... W. F. Folmer  
Can body forming machine..... M. J. Ross et al  
Cap. Apparel..... F. Maass

Car centric draft underframing..... W. G. Langenheim  
Car coupling..... P. Brown  
Car draw gear. Railway..... J. E. Courson  
Car driving mechanism. Motor..... A. Schmid  
Car. Dumping..... O. W. Meissner  
Car fender..... G. & P. Linhard  
Car window dust and cinder guard..... M. W. Hutchinson  
Cars. Auxiliary power device for..... C. C. Palmer  
Caramel cutting and wrapping machine..... H. Y. Armstrong  
Carbureter..... J. A. Barber  
Carbureter..... G. L. Harvey  
Carpet renovator..... 2 pats..... J. S. Thurman  
Carpets. Manufacturing knotted..... H. Panitschek et al  
Cash register..... F. C. Osborn  
Caster. Furniture..... G. A. Rentschler et al  
Caster pintle..... W. Livingstone  
Caster socket..... W. Livingstone  
Casters, &c. Wheel or roller for..... W. Livingstone  
Cement blocks. Core for making..... R. B. Coltrin  
Centrifugal machines. Froth condenser for..... J. L. Bergh  
Chain machine..... H. R. Fenner  
Changer..... J. Thomson  
Chuck and countersink. Combined..... J. J. Bell  
Cigarette cartridge and blank for making same..... A. Leblanc  
Cigarette machine..... O. Bergstraesser et al  
Clasp..... J. Ritter  
Cleaning and waxing pad..... A. Bing  
Climbing apparatus and support. Aerial..... H. Rodde  
Cloth milling machine..... J. C. Tinker et al  
Clothes hook..... O. Gagnon  
Clothes wringer..... A. V. Ackerman  
Clutch..... P. A. Houghtaling  
Clutch..... W. S. Graham  
Coffin..... T. A. Smith  
Coil taping machine..... W. H. Bangs  
Coin delivery apparatus..... J. H. Albert et al  
Comb..... F. Mosterts  
Communication with the aid of electromagnetic devices..... L. Kitsee  
Compartment box..... P. Diehl  
Composition of matter..... J. W. Brown  
Composition of matter and manufacturing same..... A. Ramsdell  
Core setter..... G. A. Johnson  
Corn shock compressing device..... R. W. R. R. & B. E. Joslin  
Cotton compress..... T. J. Griffin  
Crate..... A. Klumpp  
Cultivator. One horse..... S. Smith  
Curler. Hair..... A. Sheridan  
Currents. Transformer for polyphase alternating..... E. Ziehl  
Curtain..... E. H. Duchemin  
Curtain fixture..... C. B. Lakin  
Cutting tool..... R. A. Breul  
Cycles, &c. Means for propelling..... S. Smith  
Derrick swinging and controlling device..... H. N. Covell et al  
Disinfectant holder for water closet bowls..... G. Deimel  
Disinfecting water closets and the seats thereof..... F. Gardner  
Disk implement cleaning attachment..... W. L. Walton  
Display box..... T. L. Sturtevant  
Display cabinet and adjustable shelf..... S. E. Briggs  
Display stand..... H. Stahmer  
Display stand..... A. J. Merton  
Door check..... W. H. Dunbar  
Door check..... J. D. Humphrey  
Door fastening. Sliding..... W. R. Russell et al  
Door hanger. Adjustable..... D. S. Watson  
Draft gear..... J. F. Courson  
Draw bench..... G. Baehr  
Draw bench..... E. E. Quimby  
Draw bench and sizing rolls..... P. C. Patterson et al  
Dredge. Suction..... L. W. Bates  
Dress shield..... D. Basch  
Drill coupling..... L. C. Preston  
Dust pan..... T. Clover  
Dusting and cleaning garments. Apparatus for..... W. Harbough  
Dye. Acridin..... C. L. Muller et al  
Dye and making same. Disazo..... P. Julius  
Dye and making same. Yellow acridin..... O. Nastvogel  
Dye. Azo..... C. Schraube et al  
Electric arcs. Controlling..... E. Thomson  
Electric battery..... D. H. Wilson  
Electric cable..... J. H. West  
Electric carrier and hoisting device overhead..... H. M. Harding  
Electric heater..... J. H. Jenkins  
Electric machine. Dynamo..... O. F. Conklin  
Electric machines. Compounding dynamo..... 2 pats..... E. B. Raymond  
Electric machines. Cooling dynamo..... H. G. Reist  
Electric meter. Alternating current..... 2 pats..... C. P. Steinmetz  
Electric motor controller..... E. R. Carichoff  
Electric motors. Controlling..... M. W. Day  
Electric regulator..... C. P. Steinmetz  
Electrical conductor..... E. Thomson  
Electrical distribution system..... C. P. Steinmetz  
Ellipsograph..... G. W. Sherman  
Embossing press..... A. Telschow  
Embroidering machine..... A. Laubscher  
Enamels and glazings. Manufacture of white and light colored..... R. Rickmann  
End gate lock..... F. N. Bressler  
End play device for rotary machines..... H. Geisenhoner  
Engine frame. Steam..... G. H. Reynolds  
Engine igniter. Hydrocarbon..... W. W. Tuck et al  
Engines. Apparatus for controlling pumping..... R. Wright  
Eraser and calendering device. Combined..... P. W. Edwards  
Excavating apparatus..... R. Bowker  
Excavating apparatus..... A. Klatt  
Explosion motor..... J. P. E. Liet  
Eyeglass mounting..... S. N. & F. W. Stone  
Fare receipt slip..... F. S. Borton  
Fastener..... W. P. Devine  
Fat in granular form. Preparing..... A. E. Iveson et al  
Feed lubricator. Choke..... G. S. Webster  
Fence guard. Barb wire..... J. A. Anderson  
Fiber cleaning machine..... S. B. & M. E. Allison

Fertilizer distributor and cultivator. Combined..... C. M. Huff  
Fibrous or other material. Apparatus for compressing..... G. A. Lowry et al  
File. Letter..... F. W. Tobey  
Firearm ejector mechanism..... R. T. Torkelson  
Firearm. Magazine..... W. B. Farwell  
Fire escape..... W. D. Rupp  
Fireplace..... A. E. Weidinger  
Fireproof blind or door..... 2 pats..... W. R. Kinnear  
Fireproof window..... F. Voigtman et al  
Fishing net..... C. F. Pike  
Flood gate having movable closing body..... M. Carstanjen  
Form. Sleeve..... A. J. Day  
Fruit pitting and stuffing machine..... S. M. Brown  
Furnace..... F. W. Blake  
Furnace charging mechanism..... P. C. Patterson  
Furnace draft and damper regulator..... W. F. Wilmoth  
Furnaces. Working zinc and substances containing silicic acid in electric..... A. Dorsemagen  
Furniture. Convertible article of..... W. M. Boazman  
Gage shears..... F. H. Farnham  
Game board..... 2 pats..... H. L. Haskell  
Game piece..... H. L. Haskell  
Game, toy, and advertising device..... O. O. Stageberg  
Garment holder..... reissue..... J. D. O'Brien  
Garment supporter..... J. Davis  
Gas burner..... A. Beler  
Gas burner. Acetylene..... S. P. Watt  
Gases. Concentrating..... H. A. Frisch  
Gas cut off. Automatic..... A. M. Shough  
Gas furnace..... E. P. Reichhelm  
Gear. Transforming..... W. H. Brewster  
Gearing. Antifriction..... J. B. Butler  
Glass tiles and sheets. Manufacture of..... W. T. Nicholls  
Golf ball..... E. Kempshall  
Golf ball..... 2 pats..... E. Schultz  
Golf ball pocket..... R. T. Crane  
Governor..... H. J. Bouvier  
Governor. Speed..... H. H. Nightingale  
Grain dump and elevator. Combined..... A. W. Koon  
Grate. Endless chain..... W. J. Taylor  
Gun. Automatic..... A. Burgess  
Gun. Discharge actuated breech loading..... S. N. McClean  
Gun sighting apparatus..... C. P. E. Schneider et al  
Hammer. Power..... H. Feldhus  
Handle socket. Adjustable..... T. Morrin  
Harness box and buckle device..... J. M. Lebens  
Harvester and shocker. Corn..... L. Freeman  
Harvester. Corn..... F. M. Wideman et al  
Harvesting implement..... B. R. Huske  
Hat block. Pneumatic..... R. Lamont et al  
Hay or fodder fork..... F. Dalley  
Head gate..... H. W. Elder  
Head rest..... W. H. Elliott  
Heel and skiving machine..... J. H. Underwood  
Hinge. Gate..... G. E. Rickel et al  
Hobby horse..... J. W. Smith  
Hoisting apparatus..... W. A. Bock  
Hoisting bucket..... O. & J. Johnson  
Hoisting engine safety apparatus..... J. Karlik et al  
Hoop coiling machine..... A. F. Ward  
Horse overshoe..... J. B. McClintock  
Hose clamp..... F. T. Lippincott  
Hot air machine..... A. Heil  
Hub. Vehicle..... D. Morse et al  
Hydraulic engine..... A. Legg  
Hydrocarbon burner..... J. M. & L. P. Beech  
Ice plane..... H. Bodenstein  
Ice planing knife..... H. Bodenstein  
Illusion apparatus 2 pats..... A. W. Booraem et al  
Index system. Card..... I. B. Hendrickson  
Index systems. Locking device for card..... D. E. Hunter  
Inductance coil..... F. Dolezalek  
Ink well..... W. S. Claypool  
Insecticide distributor for planters..... H. Swindler  
Insole..... H. & J. R. Campbell  
Insulated rail joint..... W. E. Karus  
Insulating metallic surfaces or wires..... J. A. Heany  
Insulator. High potential..... G. H. Rupley  
Ionone. Making..... A. Strebel  
Jail or cage. Portable..... J. A. Youngblood  
Key plate for use in the manufacture of tune plates or cylinders..... F. Schippers  
Key ring..... J. L. Sommer  
Ladder and scaffold. Combined..... M. Bauer  
Ladder. Folding..... H. Labranche et al  
Ladder. Step..... M. E. Trafton  
Lamp..... W. J. Smart  
Lamp..... M. S. Hufschmidt  
Lamp. Electric arc..... J. A. Heany  
Lamp. Gas or vapor..... O. C. Hoffmann  
Lamp. Incandescent spirit..... R. E. Walther  
Lamp. Interchangeable direct and alternating current arc..... M. H. Baker  
Lantern. Signal..... A. C. Bunne  
Lathe dog..... T. C. Thompson  
Lathes. Feed mechanism for screw cutting..... W. A. Wood  
Laundry gloss..... O. M. Nash  
Lawn edge trimmer..... W. W. McCallum  
Leather. Imitation..... G. Youngwitz  
Ledger. Flat opening loose leaf..... G. F. C. Houghton  
Legging..... S. W. Alvord  
Lens..... C. A. H. Harting  
Level. Spirit..... L. Desmarais  
Leveling rod. Self-computing..... A. S. Doak  
Lever press. Compound..... S. J. Webb  
Life preserver..... J. E. Armstrong  
Lifting jack. Screw..... T. Hampton  
Lithographic purposes. Electrolytically preparing metals and alloys for..... O. C. Strecker  
Lock..... J. O'Connor  
Lock and latch..... J. C. Almar  
Locomotive engine..... J. E. Roberts  
Locomotive exhaust..... F. Robinson  
Log loader..... J. R. McGiffert  
Log raft..... J. Ayres  
Loom..... W. B. Erskine  
Loom for the manufacture of knotted carpets..... H. Panitschek et al  
Loom. File fabric..... F. Tonnar  
Loom take up mechanism..... C. F. Roper  
Lumber gluing press..... P. Schneider  
Mail bag receiver and deliverer..... W. T. Fulton et al



Mallet.....G. F. Kenney  
Mast arm fixture. Swinging jointed.....E. N. Davis  
Match box.....E. G. Nordblom  
Matrices. Producing.....J. Kitsee  
Mattress making machine.....D. Wagner  
Measuring instrument. Electric.....R. H. Read  
Mechanical movement.....L. D. Gibson  
Mechanical movement.....M. W. Hibbard  
Metal finishing machine. Strip.....C. C. Webster  
Metal to molds. Apparatus for supplying molten.....2 pats.....C. C. Webster  
Micrometer gage.....A. Rieffel  
Milk or cream cooling apparatus.....E. G. N. Salenius  
Mining machine. Coal.....W. S. Bogle  
Moistening device.....H. M. Cloude  
Molding machine.....J. C. Bradley et al  
Mop Floor.....J. M. Michael  
Mortising machine.....W. B. Reasoner  
Motor.....B. V. Szabo  
Motor control system.....F. E. Case  
Motor controller.....reissue, G. E. Kranse et al  
Motors. Vibration equalizing support for.....A. Bochet  
Mower. Lawn.....C. Zickler  
Multicircuit generators. Regulating.....H. H. Wait  
Multicircuit generators. Regulating mechanism for.....H. H. Wait  
Nail making machine.....J. H. Goetsche  
Nut lock.....W. A. Somerby  
Nut lock.....O. Feher  
Nut lock.....W. H. Nelson  
Nut lock.....F. Peterson  
Nut lock.....A. A. and E. L. Golden  
Oil-burner.....E. R. Waterman  
Oil-burner.....W. S. Jenkins  
Oil-burner.....C. W. Sievert  
Oil-heater.....S. B. Morss  
Oils or the distillates or residuals thereof. Treating mineral.....S. Stewart-Wallace et al  
Oiling apparatus. Windmill.....S. W. Scott  
Ore concentrating table.....W. G. Dodd  
Outlet or junction box.....M. F. Whiton  
Oven. Oil heated.....C. H. Higgins  
Oyster shucking or oyster opening knife.....R. H. Cooley et al  
Packaging machine.....W. H. Doble  
Pail. Milk.....J. B. Locke  
Paint. Antifouling.....T. H. Denney  
Palette.....W. A. Sussmiltch  
Paneled member for sheet metal structures.....P. M. Wege  
Paper box.....W. G. Haas  
Paper fastener.....L. C. Cox  
Paper feeding and stencil printing apparatus. Automatic.....A. B. Dick  
Paper lifting mechanism.....W. W. Tuck et al  
Paper making machine.....C. J. Bradbury  
Peeling machine. Fruit.....L. F. Graham  
Pen attachment. Fountain.....J. A. Hamilton  
Pencil sharpener.....2 pats.....D. F. Oliver  
Photographic print washer.....A. Van Hoorn  
Photographic printing frame.....W. G. Wood  
Photographs or other card holder.....W. R. Magie  
Piano. Tremolo.....P. Pomeroy  
Pignos. Combined touch regulating and mute attachment for.....L. Harris et al  
Pin clasp.....H. T. Igelstrom  
Pipe. Apparatus for drawing butt weld.....P. Patterson  
Pipe coupling.....A. G. Mersing  
Pipe coupling. Duplex.....J. J. Reilly  
Pipe. Drawing butt weld.....P. Patterson  
Pipe hanger.....J. Collis  
Pipe stopper and tobacco tamper.....J. S. von Nieda  
Planter. Cotton.....R. A. Brown et al  
Plants. Poison distributor for growing.....E. Zedlitz  
Plaster. Blister.....E. W. McAllister  
Plastic materials. Machine for forming interior of.....F. M. Locke  
Plastic surfaces. Means for ornamenting.....E. P. Brandt  
Playing ball.....3 pats.....F. H. Richards  
Pliers.....H. L. White  
Plow. Subsoil.....N. B. Cash  
Plumb, level, and square. Combined.....A. M. Bennett  
Pneumatic despatch tube carrier.....E. A. Fordyce  
Pneumatic despatch tube system.....E. A. Fordyce  
Pocket book.....J. T. Jagodnig  
Powders. Machine for feeding and wrapping.....F. A. Robinson  
Power controlling device.....R. Wick  
Printer's quoin.....H. P. Hamel  
Printing and addressing machine. Combined.....C. M. Runyan et al  
Printing machine inking mechanism.....T. M. North  
Printing machine inking mechanism.....J. White  
Printing machine inking mechanism.....T. M. North  
Printing machine. Strip.....H. C. Lavery  
Protractor. Bevel.....C. H. Barnes  
Pulley. Split.....C. H. Bicalky  
Pulp engine.....T. Bassler  
Pump.....C. G. Nyberg  
Pump. Centrifugal.....S. W. Luitwieler  
Pump or exhaust. Vacuum.....T. A. Ruse et al  
Pumping apparatus. Water.....G. J. Roberts  
Punching bag apparatus.....G. Yoerger  
Puncture healing compound.....L. C. Grant et al  
Racking device.....S. M. Rhoads et al  
Radiator.....G. C. Hawkins  
Rail joint.....M. E. Streepy  
Rail joint nut lock.....E. B. Murray  
Rails. Device for preventing the creeping of.....H. Derpmuller  
Railway. Electric.....W. B. Potter  
Railway. Electric.....E. A. Sperry  
Railway frog heel riser.....F. B. Bradley  
Railway. Logging.....J. W. Boyd  
Railway signaling system.....2 pats.....H. Bezer  
Railway track structure.....C. B. Voynow  
Ramrod, gun rest, and bayonet. Combined.....J. Wheeler  
Reaping machine attachment.....I. E. Shumaker  
Refrigerator building.....H. T. Myers  
Rein holder. Wheel operated.....L. Huenke  
Retort charging apparatus.....J. De Brouwer  
Rheostat.....F. Mackintosh  
Rheostat.....J. L. Hall  
Riveting machine.....W. J. Whalen  
Rock drill.....F. Coyle

Rod coupling.....P. Carolan  
Rolling machine. Car wheel.....H. W. Fowler  
Rolling machine. Gear.....W. L. Jones  
Rolling mill guide.....J. H. Mellors  
Roof.....H. N. Hansen  
Rotary engine.....J. A. Grove  
Rotary engine.....W. E. Troutman  
Rotary engine.....W. P. Allen  
Rotary engine.....S. E. Carothers  
Rowing mechanism. Bow facing.....D. R. Sheen  
Rule. Measuring.....J. A. and F. L. Traut  
Rule or straight edge. Folding.....J. Wurschmidt  
Sack bag or other flexible receptacle.....reissue.....A. M. Bates  
Sad iron heater.....E. F. Fisher et al  
Sausage filling and linking machine.....J. A. Biberfeld  
Saw mill. Band.....R. F. Barker  
Saw. Wabbling.....J. A. Peoples  
Scale. Computing.....E. Finn  
Scale. Traveling crane.....F. W. Taylor et al  
Scow unloading apparatus.....J. W. Reno  
Scraper and scoop. Combined.....S. M. Spangler  
Scraper. Fork.....J. S. Healea  
Screen.....J. E. Duncan  
Screw threading and beading machine.....A. P. Wolfe  
Screw wrench.....L. S. Starratt  
Seal. Car.....H. H. Liemke  
Sealing in machine.....A. Swan  
Seam stretcher.....J. A. Tessmer  
Seating.....F. S. Brooke  
Seed drill trash cleaner.....O. E. Johnston  
Sewing machine attachment drawer.....P. Diehl  
Sewing machine guide.....G. Scott  
Sewing machine. Lock stitch.....G. E. Warren  
Sewing machine ruffler and gatherer.....J. F. Wilkinson  
Shade and curtain hanger.....J. P. Gerth  
Shaft sinking apparatus.....P. G. Moran  
Shaping machine cross head feed.....G. J. Meyer  
Shaving cup.....W. A. Lemon et al  
Sheet metal bending machine.....C. W. Kennedy  
Shirt waist holder.....F. S. and A. E. Miller  
Shock loader.....H. O. Kolsbun  
Shoe box.....J. C. Leclerc  
Show case.....O. Yates  
Show case fastener.....P. S. Scott  
Shutter operator.....J. F. Stackhouse  
Sign.....L. A. J. Muller-Thym  
Sign. Day and night corner.....E. W. Edwards  
Sign. Street or other.....E. F. Dremann  
Signs. Apparatus for displaying movable.....J. P. Bryan  
Signaling.....R. C. Spaulding  
Signals through space. Apparatus for communicating.....L. De Forest et al  
Signals through space. Communicating.....L. De Forest et al  
Signature gatherer.....D. M. and D. G. Smyth et al  
Signature gathering machine.....H. L. Roberts  
Siphon. Pneumatic.....A. J. Weekley  
Slag casting machine.....C. H. Rhoad  
Snow plow.....M. Rounds  
Sodium cyanid. Making.....F. Roessler  
Spectacles or eyeglasses. Supplementary lens mounting for.....L. A. Conn  
Speed indicator.....L. Mott  
Speed mechanism. Variable.....W. A. Wood  
Spinning or twisting artificial fibrous material.....R. W. Strehlenert  
Spouts. Means for supporting and operating distributing.....P. Nicolay  
Spraying device.....R. E. Chapin  
Spring wheel.....A. H. Huth  
Square. Bevel.....E. W. Streed  
Stacker for stalk shredding machines. Pneumatic.....C. E. Curtiss  
Stair rod.....F. S. Anderson  
Stalk puller.....W. B. McKinly  
Stamping press.....A. Lion et al  
Stanchion. Cattle.....D. F. McLennan  
Stay strip.....M. D. Knowlton et al  
Steam boiler.....R. McKay  
Steam generator.....J. H. Campbell  
Stoker for mine refuse or other very fine fuel. Automatic.....J. MacCormack  
Stone dressing or polishing tool.....E. C. Bassett  
Stop fastening.....H. H. Greene  
Storage battery.....E. J. Knapp  
Storage structure.....A. Smith  
Stove or furnace.....G. W. Cope  
Stove top plate.....C. L. Beach  
Street guide or sign.....F. K. Plumbly  
Sulfite compounds. Making.....H. H. Wing  
Sulfurylchlorid. Making.....R. Knietsch et al  
Superheater.....F. D. Potter et al  
Superheater.....4 pats.....J. P. Sneddon  
Suspender cast off.....F. B. Sweet  
Suspenders.....G. E. Adams  
Syringe.....T. L. Jones  
Syringe. Fountain.....J. H. Stearns  
Tables. Collapsible leaf for extension.....H. Johnson  
Tailings. Apparatus for removing.....J. H. A. McPhee et al  
Tank heater.....J. Strahm  
Telegraph signals. Apparatus for determining the direction of space.....2 pats.....J. S. Stone  
Telegraph signals. Determining the direction of pace.....J. S. Stone  
Telegraph signals. Simultaneously transmitting and receiving space.....J. S. Stone  
Telegraphy. Wireless.....L. D. Forrest et al  
Telephone and telegraph systems. Combined.....C. E. Buell  
Telephone exchange systems. Supervisory signal for.....C. E. Scribner  
Telephone mouthpieces. Antiseptic protector for.....R. I. Willmarth  
Telephone swiveling trumpet.....A. Schoeler  
Telephone system.....W. M. Davis  
Telephone, telegraph, electric light, and power system. Combined.....A. M. Stark  
Telescope. Prism.....W. H. Harvey  
Telescopic compound engine.....W. Schneider  
Tethering pin.....R. C. Eldridge  
Ticket. Combination premium.....G. F. Schrafft et al  
Tile.....W. P. Meeker  
Tiling for floors, walls, ceilings, fireplaces, &c.....F. Alcan  
Tiling for walls or ceilings. Metallic.....W. H. Landkrohn  
Time indicator.....E. Fitch  
Tire fastening.....R. M. Connable  
Tire. Motor vehicle.....M. Polack

Tire. Pneumatic.....H. N. B. Good  
Tire repairing compound and preparing same.....M. McWhorter  
Tire. Resilient.....J. P. Le Grand et al  
Tire tightener.....G. W. Cook  
Tool. Combination.....C. L. Peirce, Jr  
Toy.....A. Gibson  
Toy.....M. E. Behn  
Toy. Resonating or sounding.....J. L. Gammell  
Trace fastener.....B. M. & W. E. Thornton  
Tramway switch.....J. W. Kefer  
Transit.....A. Lietz  
Transporting and distributing apparatus.....C. H. Butler  
Tray for beer glasses.....A. Markman  
Trolley catcher.....A. Thode  
Trolley wheel.....L. Chroninger et al  
Trousers.....S. A. Myers  
Truck. Flexible car.....C. S. Shallenberger  
Truck. Railway.....W. C. Happe  
Truss. Hernial.....F. J. Hage, Sr  
Tube plate handling apparatus.....J. J. Boax  
Tubing. Apparatus for the manufacture of butt weld.....P. Patterson  
Tug. Thill.....S. H. Frost  
Tunnels. Constructing and laying subaqueous.....H. F. D. n. h. m  
Turbine engine.....E. F. Cameron  
Turbine engine.....C. R. Ingham  
Type. Font of.....J. F. Ames  
Type setting and justifying machine.....F. A. Johnson  
Type writer attachment.....C. F. Eckert  
Type writing machine.....W. J. Barron  
Type writing machine intermediate line spacing device.....J. A. Garland, Jr  
Valve.....J. H. Bickford  
Valve.....W. Cooper  
Valve. Automatic sprinkler.....O. Hoffmann  
Valve mechanism.....T. R. Green  
Valve motion.....R. C. Carroll et al  
Vapor burner.....A. A. Ball, Jr  
Varnish and ink. Manufacture of printers'.....A. G. Wass  
Vault.....J. S. Lester  
Vehicle brake.....A. A. Ball, Jr  
Vehicle brake.....C. D. Quillen  
Vehicle brake.....J. W. Whalen  
Vehicle driving mechanism. Motor.....J. Ledwinka  
Vehicle. Speed.....F. S. Stodard et al  
Vending apparatus. Coin controlled.....T. R. Laing et al  
Veneer package separator.....W. J. Ott  
Ventilator.....G. G. Britton  
Vessels. Means for preventing racing in screw propelled.....G. Sollitt  
Vise. Pipe.....M. Glenn  
Voting machine.....G. L. Hoxie  
Wagon reach.....J. T. Crampton et al  
Warm air register.....T. E. Hunt  
Washboard.....W. Beecker  
Washing machine gearing.....L. Paul  
Waste pipe trap.....J. K. White et al  
Watch barrel.....L. A. Erickson  
Water closet and flushing reservoir. Combined.....N. B. Wales  
Watchmaker's material holder.....P. C. Hall  
Water heater.....C. W. O'Neill  
Water meter guard.....A. G. De Waldo  
Water tube boiler.....C. P. Altmann  
Water tube boiler.....R. Hanson et al  
Wedge.....C. J. Grellner  
Welding furnace. Tube.....P. Patterson  
Welding. Spring pulling hook for use in butt.....E. E. Quimby  
Well boring device.....R. L. Landry  
Wheel rim.....W. Friedrich  
Winch.....H. A. L. Barry  
Wind motor.....J. M. Cochran  
Window cleaner.....C. A. Wheeler  
Window frame and sash.....C. B. Schilling  
Wire chasing or marking machine.....H. R. Fenner  
Wire cutting and straightening machine.....J. Kelley et al  
Wire stretcher.....N. P. Nelson  
Wire stretcher.....B. Myers  
Wrench.....O. P. Case et al  
Wrench.....E. Dauer  
Wrench.....I. De Ford  
Zinc ores. Treatment of.....F. Ellershausen et al

## DESIGNS.

Hot water bag, &c.....V. C. Van't Woud  
Jug or similar article.....C. J. Noke  
Pitcher or similar article.....J. W. Collins  
Spoons, forks, &c. Handle for.....C. A. Bennett  
Stone. Cut.....E. G. H. Schenck  
Stove. Gas.....J. C. Forster  
Watch fob.....F. I. Gorton

Issued December 23, 1902.

## MECHANICAL PATENTS.

Acetylene generator safety lock W. C. Homan  
Acid and making same. Metallic salts of methylene disalicylic.....S. L. Summers  
Advertising bottle or flask.....J. I. Vogeler  
Aerating agitator.....B. D. Hooper  
Air cushion.....W. H. Phillips  
Air temperature regulating and purifying device.....L. E. Clawson  
Alkalisalts of methylene disalicylic acid and making same.....S. L. Summers  
Alkaline earth salts of methylene disalicylic acid and making same.....S. L. Summers  
Amusement apparatus.....E. F. Porter  
Animals. Treating.....A. Nimmo  
Annealing apparatus.....D. Bates et al  
Ash ejector.....L. Hochstein  
Auditing collectors' receipts G. E. Manwaring  
Auger. Tubular.....H. E. Klingensmith  
Axle dust guard. Carriage.....H. D. Ellis  
Bait. Artificial.....E. P. Mantz  
Baling press.....J. H. Wesson  
Baling press baling chamber.....W. T. Hulscher  
Barber's implement.....C. E. Brouillette  
Barber's shears.....J. B. Martin  
Basket.....J. H. Killion  
Basket making machine.....W. C. Schaefer  
Baskets. Combined handle and presser foot for.....F. W. Gasper  
Bat.....J. A. Hillerich  
Battery compound. Electric.....G. Bastedo  
Battery installation.....S. Lake  
Bearing. Axle spindle.....C. Tolles

Battery plates. Preparing storage.....R. C. Browne et al  
Bed and lounge. Combined folding.....M. M. Norwalk  
Bell.....G. B. Pickop et al  
Bell. Electric.....F. W. Wood  
Binder. Temporary.....F. W. Barrett  
Board setting instrument.....S. Nicholls, Sr  
Boiler.....E. G. Ofeldt  
Boiler indicator. Steam.....E. G. Moore  
Book and binder therefor. Detachable sheet.....G. C. Shepherd  
Boring tool.....G. W. Latham  
Bottle cap making machine.....B. Adriance et al  
Bottle for putting up tooth, toilet, or other powders.....T. D. Richardson  
Bottle holder.....W. J. Smith  
Bottle making machine.....A. S. Reeves  
Bottle. Non refillable.....J. A. De Vito  
Bottle. Non refillable.....I. C. Beiler  
Bottle stopper.....L. Boucay  
Bottle stopper or seal.....W. S. Dorman  
Bottle stopper. Sprinkling.....H. O. Brawner  
Bottle washing machine.....A. Perthold  
Bottles or cans. Stem holding cap for.....W. H. Beeching  
Box.....J. Lackner  
Box or chest.....G. P. Jaekel  
Braiding carrier.....J. Keleher  
Brake mechanism.....W. H. Smith  
Brake shoe.....W. E. Hutton  
Brick machine.....W. C. McElheny  
Brick truck.....S. W. Vance  
Brooder.....G. R. Adams  
Brush.....H. F. Ebert  
Brush.....reissue.....J. P. Wiens  
Buffer coupling. Automatic.....A. D. Smith  
Button posts. Gang of collar.....N. B. Evans  
Buttonhole attachment for garments.....R. S. Hoyt  
Cable hanger.....P. H. Auxer  
Can hoop. Milk.....B. T. Wood  
Candlestick.....D. A. Ryan  
Cane, &c. Machinery for handling sugar.....C. Piez  
Car brake. Automatic railway.....G. W. Stockin  
Car buffing mechanism.....W. Kelso  
Car coupling.....W. A. Moorland et al  
Car coupling draft rigging.....J. A. Hinson  
Car coupling release rigging.....W. F. Kiesel, Jr  
Car door. Pneumatically actuated.....A. W. Sullivan et al  
Car. Hand.....J. Donovan  
Car pinching and moving device.....H. J. Kayser  
Car seat foot rest.....L. Janson  
Car twin spring draft rigging. Railway.....C. F. Street  
Cars. Draw gear for the railway or like.....A. D. Smith  
Cars. Friction draft rigging for railway.....2 pats.....J. J. Hennessey  
Cars. Tandem spring draft rigging for railway.....W. H. Miner  
Carbonated beverages. Apparatus for manufacturing and dispensing.....O. J. Price  
Carbureter.....G. A. Manwaring  
Carbureter. Explosive engine.....C. N. Nelk  
Carriages. Automatic stop for children's.....R. T. Jones  
Cartridge shell reloading device.....J. H. Wesson  
Cask pitching device.....P. W. Van de Westelaken  
Caster.....F. Buesser  
Cattle guard.....E. B. Washburn  
Cattle guard.....J. J. Crane  
Cellulose. Manufacturing filaments from.....C. H. Stearn  
Centrifugal apparatus.....A. Holland  
Chairs. Fan for rocking.....G. J. Peacock  
Chimneys' walls, &c. Construction of.....J. F. Lyman  
Chlorates. Manufacturing.....R. Threlfall  
Chuck. Lathe.....(Reissue) J. C. Potter et al  
Churn.....H. C. Meeker  
Cigar stand.....T. Hughes  
Cigarette making machine.....J. Macdonald  
Cigarette mouthpieces. Rerolling mechanism for.....K. Harnisch  
Cigarette or cigar box.....S. Goldfaden  
Cigarette tube.....K. Harnisch  
Cigarette tube forming machine.....K. Harnisch  
Circuit breaker.....E. A. Stevens  
Clock beat adjuster. Pendulum.....T. Rottler  
Clothes rack.....J. M. Downing  
Clothes rack.....W. Bagge  
Clutch. Friction.....M. Pivert  
Coaster brake.....C. Glover  
Coin controlled apparatus.....J. A. Williams  
Combination drill.....L. Sack  
Commutators. Suppressing sparking of.....R. H. Read  
Compensating system.....J. F. Kelly  
Condenser. Steam surface.....J. R. Richmond  
Condensing or cooling fluids. Apparatus for.....W. S. Colwell  
Conveyer.....J. D. Buchanan  
Conveyer.....C. W. Hunt  
Cooking apparatus. Electrical.....M. Bayno  
Copy holder.....E. F. Pittman  
Copy holder.....C. B. Towers et al  
Corn thinner's vehicle.....W. T. Mitchell et al  
Cotton chopper and cultivator.....H. C. Foster  
Cotton sweep.....B. J. Brown  
Crucible.....A. Eimer  
Cuff holder.....F. L. Long  
Cultivator.....E. Halmau  
Cultivator.....F. L. Lee  
Current interrupter.....W. Scheidel  
Current interrupter.....C. O. Schneider  
Current meter. Induction alternate.....O. T. Blathy  
Current switching apparatus. Alternating.....E. M. Hewlett  
Curtain pole.....A. O'Sullivan  
Cutting machine.....T. D. Robinson et al  
Cycle spring frame. Motor.....E. Y. White  
Damper regulator. Time.....T. E. Hunt  
Deflector.....D. J. Maloney  
Dental cement injecting tube. Collapsible.....H. L. Crutenden  
Dental cement injector.....H. L. Crutenden  
Dental occlusor.....C. L. Stocks  
Dentists' or other uses. Composition of materials for.....S. J. Spence  
Dies or forms. Apparatus for cleaning.....S. Mueller  
Direct acting engine.....A. E. Johnson  
Display card for hooks and eyes.....H. A. Francis  
Displaying cards price tickets, &c. Device for.....J. S. Cushman



Ditching machine.....C. Chapman  
 Divider, Multiple.....J. Stuhman  
 Door, Grain.....C. A. & J. J. House  
 Door, Screen.....E. Lynch  
 Door securer.....W. N. Haring  
 Drum pedal and beater attachment, Bass.....  
 Dyer's truck.....J. Knott  
 Earthenware articles, Deposition of metals on.....G. W. Laybourn  
 Eaves trough hanger.....J. Jacoby  
 Electric arcs, Extinguishing.....2 pats.  
 Electric battery.....G. Rosset  
 Electric currents, Breaking.....W. L. R. Emmet  
 Electric motors, Means for regulating and protecting.....R. Lundell  
 Electric switch.....G. H. Whittingham  
 Electrical switch.....A. H. Gibbings  
 Elevator stop.....L. E. Prescott  
 Engine.....J. W. Neil  
 Engine distributing device, Steam or air.....C. A. Brunner  
 Engine or motor.....L. Sterne  
 Engines, Exhaust expander for steam.....J. J. Haycraft  
 Engraving machine, &c.....C. B. Bishop  
 Envelop.....T. H. Davies  
 Excavating machine.....C. C. McBride  
 Explosive engine.....B. F. Bain  
 Eyeglasses.....F. Evans  
 Fall rope supporting device.....T. S. Miller  
 Fanning mill.....P. Kesselring, Jr  
 Fare register rods, &c, Handle for.....F. Brostrom  
 Fastener.....W. B. H. Dowse  
 Feed water purifier.....C. E. Ferreira  
 Fence post.....F. R. Parker  
 Fence, Wire.....A. C. Gordon  
 Filter, Cistern.....L. A. Miller  
 Fire escape.....F. G. Frishkorn  
 Fireproof composition for use on wood.....G. Blenio  
 Fireproof flooring.....A. Dickey  
 Fireproof flooring.....H. E. Grant et al  
 Fireproof sash and frame.....C. D. Hyre  
 Fishing line attachment.....J. P. Leib  
 Flies or insects, Apparatus for catching.....A. Bachner  
 Flower pot holder, Waterproof.....L. P. Cheney  
 Folding box.....W. E. Burton  
 Furnace attachment, Oil burning.....J. R. Scott  
 Furnace for the destruction of town refuse.....G. Watson  
 Furnaces, Machinery for charging steel or like.....A. Patterson  
 Fuse.....W. L. R. Emmet  
 Game apparatus.....W. Ransom  
 Garment clasp.....J. V. Pilcher  
 Garment fitting device.....C. Anderson  
 Gas, Apparatus for charging closed compartments with.....T. A. Clayton  
 Gas engine.....F. E. & M. E. Vaughn  
 Gas from peat, Producing.....L. L. Merrifield  
 Gas generator.....J. A. Jenney  
 Gas generator, Acetylene.....F. Simonson  
 Gas generator, Acetylene.....S. M. Klarquist  
 Gas generator, Acetylene.....D. N. Long  
 Gas generator, Acetylene, 2 pats.....E. Moreau  
 Gas main stopper.....R. D. Leech  
 Gas purifier.....W. J. Renwick et al  
 Gas, Purifying.....E. Zahm et al  
 Gasometer.....J. W. Weeks  
 Glass leer.....D. J. Ghrist et al  
 Grain drill, Disk.....J. W. Smith et al  
 Gun firing mechanism.....A. T. Dawson et al  
 Guns or other uses, Explosive charge for.....R. W. Scott  
 Halter tie regulator and securer.....J. C. Covert  
 Harvester, Broon corn.....J. E. Larson  
 Harvester, Corn.....C. E. Detling  
 Harvester evener, Corn.....G. S. Thompson  
 Harvesting corn.....D. D. Jolly et al  
 Harvesting machine collecting boxes, Device for emptying.....C. F. Grohmann  
 Headlight for street care, &c, Adjustable.....G. F. Chapman  
 Heating systems, Automatic controlling device for steam.....J. H. Davis  
 Heating systems, Regulating.....C. G. Armstrong  
 Hinge, Lock.....H. Ritter et al  
 Hook and eye.....A. J. Gastren et al  
 Horseshoe pad.....B. M. Moore et al  
 Hose supporter hook.....M. B. Hammond  
 Hydrocarbon burner.....H. L. Warner et al  
 Icing, Apparatus for holding cakes during the process of.....C. A. Thomson  
 In-bator.....N. S. & L. V. S. Conover  
 Incubator heating and ventilating system.....G. R. Adams  
 Induction coil, Balanced circuit.....J. P. Alexander  
 Ink eradicator.....H. Mock  
 Jars, &c, Cover fastening for fruit.....I. P. Doolittle  
 Joint.....R. B. Macphail  
 Junction box.....C. G. M. Miller et al  
 Knitted or looped undergarment.....F. H. Ruffner  
 Knitting machine, Rib.....R. W. Scott  
 Labeling device.....T. Cadwallader  
 Labeling machine.....D. W. Kneisl  
 Lamp globe holder.....R. D. Cranston  
 Lamp socket, Electric.....C. D. Platt  
 Lamp socket, Incandescent.....A. P. Seymour  
 Last.....W. B. Arnold  
 Latch.....J. W. Connolly  
 Lathe center rest.....A. Kingsbury  
 Lettering and ornamenting metallic articles, Die for.....N. Stafford  
 Liquids under pressure, Producing.....A. Vogt et al  
 Loading device.....H. Ellis  
 Lock.....I. W. Wolf  
 Lock and latch, Combined.....J. B. Cox  
 Locomotive boiler.....W. B. Warren  
 Loom, Lappet.....T. Stone et al  
 Loom shuttle motion.....A. Chevrete  
 Loom weft replenishing mechanism.....J. T. Bolton  
 Lounge, Convertible.....T. Hauser  
 Mail bag catcher and deliverer.....C. W. Stangler  
 Marble shooter.....W. R. Kizer  
 Match making machine.....E. H. Eisenhart  
 Match making machine.....21 pats.  
 Mattress upholstering machine.....C. E. Hadley  
 Measuring apparatus, Distance.....P. Hoffman  
 Measuring tank, Automatic.....J. E. Hartman  
 Merry go round.....J. Fromm

Metal grinding and polishing apparatus.....L. C. Forwood  
 Miter box.....2 pats.....M. D. Converse  
 Mop and wringer therefor, Combined.....E. Hilker  
 Mop head.....J. C. Look  
 Mouthpiece material, Cutting mechanism for forming projections on.....K. Harnisch  
 Movement cure apparatus.....G. J. Macaura  
 Mower, Lawn.....F. L. Adams  
 Mowing machine.....S. V. Kennedy  
 Mud chamber.....D. Neale  
 Music leaf turner.....G. Johnson  
 Necktie fastener.....J. H. Franz  
 Night light.....G. H. Lilley  
 Nut lock.....P. K. Ebersole  
 Nut lock.....A. M. Hart  
 Oil burner.....V. F. Lassoe et al  
 Oil burner, Crude.....D. E. Smith  
 Oil separating device.....D. J. Lewis, Jr  
 Ore storage and delivery bin.....J. W. Seaver  
 Ores containing precious metals, Treatment of.....F. W. Martino  
 Organs, Motor for self playing.....C. Warren  
 Organs, Subbass for self playing.....C. Warren  
 Packing gasket.....(Reissne), J. J. & A. Schier  
 Packing, Piston.....M. Montgomery  
 Packing, Rod.....O. J. Garlock  
 Paper cutting and rewinding machine.....P. J. Wolf  
 Paper feeding device.....F. Schiiz  
 Paper machines, Rotary suction apparatus for.....A. T. Luckenbach  
 Paper, &c, Mechanism for severing sheets from webs of.....G. E. Pancoast  
 Pen wiper.....F. J. Muller  
 Pens, &c, Means for attaching caps to fountain or other.....J. Slater  
 Pencil sharpener.....R. W. Gates  
 Pencil sharpener.....M. E. Mead  
 Photograph cabinet, Revolving.....E. & M. Bekker  
 Photographic developing tray.....J. N. Tolpa  
 Photographic pictures, Developing.....A. Eichengrun  
 Picture suspending device.....C. H. Worsnop  
 Pile fabric, Woven.....E. F. Clark  
 Ping pong racket.....L. H. Nelson  
 Pipe joints, Apparatus for constructing cold packed.....A. N. Rankin  
 Plane.....M. D. Converse  
 Planter, Corn.....W. S. Graham  
 Plow, Reversible garden.....J. W. Nicholas  
 Plumb and level.....J. H. & A. E. Weyandt  
 Poison holder.....C. O. Harker  
 Poke, Animal.....H. M. Taylor  
 Preserving fruits.....J. M. A. Lacomme  
 Press.....R. T. Allen  
 Printing press.....A. B. Carroll  
 Propelling vessels by steam turbines.....C. A. Parsons  
 Pulley power and motion transmission.....J. W. Cole  
 Pump.....J. Maurer  
 Pump.....P. H. Deis  
 Pump, Air or steam operated.....F. Heil  
 Punching and printing machine.....J. H. Shepherd  
 Purse or bag frames, Catch or lock for.....E. E. Witte  
 Purse or bag frames, Holding catch for.....B. vom Eigen  
 Puzzle.....C. W. Fram  
 Rail joint.....S. O. Dougherty  
 Railway signaling system.....W. Locke  
 Railway switch, Automatic.....A. G. Lawrence  
 Railway switch protector.....J. C. Dicks  
 Railway tie, Metallic.....J. H. Chance  
 Range and broiler, Electrical cooking.....M. Bayno  
 Reamer.....2 pats.....J. N. Lapointe  
 Reflector, Incandescent lamp.....J. Taussig  
 Refrigerating compartments, Regulating apparatus for.....R. W. Rollins  
 Register.....J. H. Warner  
 Releasing apparatus, Emergency.....J. F. Bjurlund  
 Roller coaster.....G. L. Jontz et al  
 Rolling mill roll polishing attachment.....C. Markwort et al  
 Rotary cutter.....J. Ettinger  
 Rotary engine.....J. W. Pickel  
 Rotary engine.....S. S. Whitaker  
 Rotary engine.....J. Springer et al  
 Rotary engine.....W. J. Mackle  
 Rotary motor.....D. P. Upson  
 Saddle tree and elastic checkrein and back strap holder, Combined.....J. I. Ayres  
 Salter, Stock.....J. L. McHenry et al  
 Sand carriage, Self strewing.....C. A. Green et al  
 Sand drying and heating apparatus.....W. C. McElheny  
 Sash, Revolving window.....W. E. W. H. & D. O. Ogden  
 Sash, Window.....C. D. Tabor  
 Saw clamp.....M. D. Converse  
 Saw guide, Band.....C. Ryan  
 Saw handle.....M. D. Converse  
 Saw shipping case.....E. H. Taylor  
 Scale, Weighing.....G. Hoepner  
 Seal, Jar cover.....E. A. Marshall  
 Shade, Window.....P. G. Emery  
 Shaft bending machine.....C. N. Allerding  
 Shaft shackle, Vehicle.....S. R. Bailey  
 Shafts, Device for withdrawing keys from.....M. C. Bement et al  
 Shingle.....E. Schneider  
 Ships' bottoms, &c, Coating.....A. P. Cuthriell  
 Shirt neckband expanding ring.....H. H. Horr  
 Shoe.....C. K. Flowers  
 Shoe tip clamp.....R. E. Woolman  
 Show case.....A. D. Guibert  
 Shutter holder.....C. Holmcraus  
 Shuttle check.....W. H. Bailey et al  
 Signaling apparatus, Marine.....W. B. Barker  
 Signaling system, Day.....B. A. Fiske  
 Sleigh knee.....M. Creighton  
 Sleigh runner, Double ender.....J. E. Hobbs  
 Silver can.....J. B. Cronch  
 Smoke consuming furnace.....B. F. Binnix  
 Snap hook.....A. R. Otterman  
 Snow removing device.....J. Sullivan  
 Soda by electrolysis, Apparatus for producing caustic.....E. A. Allen et al  
 Spectacle fitting instrument.....T. Boothroyd et al  
 Speed changing device.....E. Innes et al  
 Speed indicator operating means.....2 pats  
 Speed recording apparatus.....F. Bayerdoerfer  
 Springs, Machine for separating the coils of spiral.....F. H. Daniels et al

Speed regulator.....M. G. Miller  
 Springs, Manufacture of.....3 pats  
 Springs, Manufacture of spiral.....F. H. Daniels et al  
 Stacker, Hay.....M. H. Mooney  
 Stacker, Hay.....C. W. Nickell  
 Stacker, Straw.....C. H. Brunger  
 Steam engine.....W. S. Colwell  
 Steam engine, Multiple expansion.....J. Deneal  
 Steam shovel or excavating machine.....C. M. Harrison  
 Steering lever.....C. B. Hershey  
 Stone, Finishing artificial.....W. Black et al  
 Stone, &c, Manufacturing red aggregates for use as artificial.....H. W. C. K. Dyson  
 Stopper extractor.....H. C. Wehrle  
 Stove.....A. Landry  
 Stove, Camp.....H. M. Leininger  
 Stove or heater.....I. Brooke  
 Stove, Portable.....J. Watson  
 Strainers, Machine for making tubular.....J. H. King  
 Stump puller.....W. Anderson  
 Surgeon's operating table.....T. B. Powers  
 Suspender cast off.....J. F. Molloy  
 Switchboard, Multiple.....W. E. McCormick  
 Switches, Device for automatically opening or closing.....J. T. Rice  
 Syringe.....A. B. Jamison  
 Syringe bulb.....R. H. Eddy  
 Tablet, Writing or drawing.....F. E. Dodge  
 Tanning apparatus.....B. Jr., & W. C. Allen  
 Telegraphy, Multiplex.....H. Shoemaker  
 Telephone system.....W. C. Wright  
 Telephone transmitter circuit.....A. B. Stetson  
 Theatrical scenic arch.....E. L. Snader  
 Thresher, Flax.....J. T. Smith  
 Tie.....J. E. Glahn  
 Tire setting machines, Joint closer for rubber.....W. C. State  
 Tires, Pneumatic inner tube.....C. A. Esse  
 Tobacco filler drying machine.....H. Reber  
 Tobacco stripping or stemming machine.....M. Deiller  
 Tobacco, yarn &c, Machine for treating.....W. M. Schwartz  
 Torpedo steering apparatus.....J. Borresen  
 Toy gun.....E. J. Howard  
 Toy, Mechanical.....G. S. Gallagher  
 Track brake.....H. L. Bains et al  
 Traction wheel.....J. E. Wood  
 Traction wheel.....R. L. Dutcher  
 Train stopping apparatus.....J. P. de Braam  
 Tram and railway, Electric.....R. Hacking  
 Transfer presses, Detachable gear for.....F. L. Eberhardt  
 Trolley.....W. L. Baker  
 Trolley guard.....P. M. Reed  
 Trolley pole.....T. C. Buder  
 Turbine, Steam.....C. E. Sargent  
 Turnbuckle.....J. P. & T. J. Hais  
 Type writer.....G. W. Disher  
 Type writing machine.....C. Gabrielson  
 Type writing machine.....C. H. Shepard  
 Type writing machine attachment.....2 pats.....C. R. Kelly  
 Umbrella holder.....M. Taussig  
 Valve handle wheel.....G. M. Ritchie  
 Valve, Hydraulic.....P. H. Cowper  
 Valve locking apparatus.....R. P. Wilson  
 Vapor or gas to burners, Apparatus for regulating the supply of combustible.....W. Hooker  
 Vehicle body support.....W. D. Butler  
 Vehicle, Motor.....W. O. Worth  
 Vehicle seat lock.....W. D. Holley  
 Vehicle steering mechanism, Motor.....C. Crompton  
 Veicopede.....J. S. Copeand  
 Vending machine.....2 pats.....J. A. Williams  
 Ventilator.....S. H. Jacobson  
 Vise, Double acting.....J. Benedict  
 Wagon brake.....J. Imel  
 Washing machine.....H. M. Richardson  
 Washing machine.....B. H. Klein  
 Washing machine, Cloth.....J. M. Woelzel  
 Washline fastener.....J. M. Wood  
 Watch protector.....B. F. Giddens  
 Waters from rivers, Adjustable conduit for taking.....A. C. Ryan  
 Water page.....J. McCormick  
 Water heater.....J. Hartman  
 Water motor.....M. L. G. Wheeler et al  
 Water purifying apparatus.....L. Gathmann  
 Water regulator, Automatic.....A. H. Hutchinson  
 Water system, Circulating.....I. J. French  
 Weaner, Colt of calf.....G. M. Miller  
 Weeding and cultivating implement.....C. N. Choate  
 Well casing swage.....E. North  
 Whiffletree attachment.....J. Hafer, Sr  
 Windmill.....J. G. Benster  
 Windmills, Automatic balance attachment for.....B. Terry  
 Window cleaning apparatus.....S. C. Lawlor  
 Window screen.....A. C. Phillips  
 Wire clamp.....M. D. Kilmer  
 Wood impregnating apparatus.....2 pats.....J. L. Ferrell  
 Wrench.....W. S. Bonner  
 Wrench.....C. C. Longard  
 Wurtzilite product.....R. M. Thompson  
 Yohimbine, Salts of.....L. Spiegel

## DESIGNS.

Carpet.....L. H. Brown  
 Comb.....J. Koenig  
 Molding, Decorative.....J. E. Chapman  
 Pillow or cushion top.....E. Coyle  
 Pin.....M. Wickham von Kopp  
 Stove leg.....G. H. Droege

Issued December 30, 1902.

## MECHANICAL PATENTS.

Accounting appliance, Credit.....P. A. McCaskey  
 Adding and listing machine.....W. P. Shattuck  
 Advertising article.....V. Kust  
 Agitating and separating articles, Apparatus for.....H. B. Arnold  
 Agricultural implement.....D. Lubin  
 Agricultural machine, Power operated.....D. Lubin  
 Air brake setting devices, Track cleaver for.....2, F. L. Dodgson

Alternator, Exciting.....E. W. Rice, Jr  
 Alternators, Compounding.....E. W. Rice, Jr  
 Aluminium, Purifying.....E. L. Anderson  
 Amalgamating apparatus.....J. J. Hill  
 Ammonium salt and making same, Cobalt.....H. A. Frasch  
 Amusement apparatus.....G. W. Schofield  
 Animal shears.....H. Drysdale  
 Animal trap.....W. C. Hooker  
 Annealing furnace.....A. M. Hewlett  
 Annealing iron or steel castings.....A. M. Hewlett  
 Arc light switchboard.....E. M. Hewlett  
 Atomizer.....G. S. Tolman et al  
 Automobile transmission frame.....H. K. Miller et al  
 Ballot marker.....T. C. Spelling  
 Band cutter and feeder.....W. Miks  
 Barrel filler.....K. Enzinger  
 Bathometer.....E. G. Sjostrand  
 Bearing, Adjustable.....J. S. Heath  
 Bearing for wheels of agricultural machines, &c.....E. Baseman et al  
 Beating engine.....E. A. Jones  
 Bed attachment.....G. Goode  
 Bedstead table.....A. C. Schieding  
 Bevel and square, Combined.....T. C. Auringer  
 Bicycle prop.....J. Rasmussen  
 Binder aprons, Fastening means for.....J. G. & A. Wangerin  
 Binder lock, Detachable.....J. A. Shepherd  
 Black plates or sheets, Apparatus for making.....C. W. Bray  
 Black plates or sheets, Manufacture of.....C. W. Bray  
 Blower, Fireplace and grate.....W. F. Lowry  
 Boat, Submarine.....S. Lake  
 Boiler corrugated furnace, Steam.....D. B. Morison  
 Boiler flues, Tool for removing.....F. E. Lyon  
 Bolster, Body.....J. H. Geer et al  
 Book feed for casing in machines.....F. D. Taylor  
 Bottle, can, &c, Tooth powder.....H. B. Kent  
 Bottle holder.....A. Schneider et al  
 Bottle, Non refillable.....R. E. Kabish  
 Bottles, Combined dauber and stopper for liquid dressing.....C. S. Emmert  
 Bottles or similar vessels, Closure device.....R. B. Yerby  
 Bottles, Support for holding.....W. E. Brown  
 Boxes, Combined protector and opener for.....E. W. Smith  
 Braiding machine.....B. Kirsch  
 Brake mechanism.....G. F. Brandau  
 Brake mechanism, Fluid.....W. H. Sauvage  
 Brake shoe.....R. L. Brown  
 Brake shoe.....R. L. Durbin  
 Branding iron.....A. A. Phipps  
 Brick binder Veneer.....J. V. H. Jones  
 Brick cleaning machine.....P. Harris  
 Bricks, Interlocking.....H. Choquet et al  
 Brush.....W. Morrison  
 Brush, Fountain.....H. P. McMillan  
 Bucket.....R. J. Aspin et al  
 Burner for burning coal oil, &c.....W. L. Mersfelder  
 Cabinet, Kitchen.....H. N. Lathrop  
 Cabinet or rack, Running account hotel.....E. L. Dodson  
 Cableways, Automatic dumping device for.....J. G. Delaney et al  
 Caffeine, Making.....B. R. Faunce  
 Calculating machine.....D. J. T. Hiett  
 Calculator.....W. P. Shattuck  
 Calculator.....T. Fregoso  
 Calipers, Micrometer.....F. Spalding  
 Can opener.....J. M. Nettles  
 Cans, Machine for placing shields in.....W. E. Dement  
 Canning apparatus.....L. L. Lawrence  
 Car blocking and derailing machine.....W. J. C. Kenyon et al  
 Car bolster and bearing.....J. E. Norwood  
 Car brake mechanism.....H. E. Putney  
 Car coupling.....S. L. Trueblood  
 Car fender, Street.....W. Bilkowitz  
 Car replacer.....A. R. Batchelder  
 Car sanding mechanism.....N. Seibert  
 Car seat.....M. N. Forhey  
 Car seat.....L. Janson  
 Car, Sleeping.....J. E. Batterson  
 Car wheel.....O. A. Cadmus  
 Carburer.....J. P. Nagel  
 Carpet and weaving same, Persian.....H. Panitschek et al  
 Carpet stretcher.....J. Lawson  
 Carpet sweeper bearing.....J. W. Shanahan et al  
 Carriage, Child's.....G. E. Whitmore et al  
 Casein compound.....H. V. Dunham  
 Cash register.....J. A. Oswald  
 Casting finished pinions or gear wheels.....L. J. Crecelius  
 Cell box, Collapsible.....W. H. Ferguson  
 Chain hook, Ornamental.....J. H. Swift  
 Chain making machine.....A. S. Standish  
 Chair.....O. L. Ostendorf  
 Changer.....J. Thomson  
 Chart, Reading.....O. E. Cone  
 Cheese cutter.....E. Niggli  
 Cigar holder and ash receiver.....J. C. D. Ross  
 Clamp applicable as a clothes peg.....S. T. Ellis  
 Clay or other insoluble materials, Treating.....M. W. Phillips  
 Clock, Electric.....M. Fischer  
 Clothes line holder.....A. K. Rosenbeck  
 Clothes pin.....A. McKee  
 Clothes pin.....J. W. Tillman  
 Coal, &c, Apparatus for handling.....2 pats.....J. Campbell  
 Coating irregular surfaces.....G. D. Coleman  
 Cock, Float operated.....R. M. Paul  
 Coffin lining, Metallic.....W. W. Grotcott  
 Coin controlled case for fans, &c.....F. A. Cammann  
 Coke oven unloading mechanism.....G. H. McCracken  
 Conveyor.....C. J. Allen  
 Cooking apparatus, Steam.....H. Seiling  
 Corn gathering and husking machine.....A. Asper  
 Corn husking and fodder shredding.....B. H. Lawter  
 Corn husking and stalk cutting machine.....J. Kolling et al  
 Corset clasp.....E. M. Brigham  
 Cover blanks, Assembling device for forming straws into.....M. Van den Heuvel  
 Crane, Charging.....C. L. Taylor  
 Crane, Charging or discharging.....C. L. Taylor  
 Crane, Traveling.....J. G. Fairbanks  
 Curling iron heater case.....M. J. Maloof



Current director.....J. Reid, Jr  
 Current protective device.....W. A. Taylor  
 Currents. Means for transforming alternating  
 currents.....J. E. Woodbridge  
 Currents. Transforming alternating  
 currents.....J. E. Woodbridge  
 Currycomb or card cleaner.....C. E. Flanders  
 Cushion machine.....J. C. Linder  
 Cut out.....J. W. Howell  
 Decoupling attachment.....L. Boivin  
 Delivery mechanism.....H. A. W. Wood  
 Dish cloth. Chain.....C. D. Hunt  
 Display case. Folding.....C. S. Morris  
 Display rack.....W. H. Blandin  
 Door for banks, &c. Trap.....J. W. Castleman  
 Door lock. Sliding.....F. J. Hanrahan  
 Drawer for bins.....J. M. Wilson  
 Drilling device.....L. A. Hardison  
 Drilling machine.....R. W. Frost  
 Drip pan indicator device.....F. E. Wiesner  
 Dust pan handle attachment.....F. C. Avery  
 Dyeing apparatus.....J. O. Obermaier  
 Eccentric. Adjustable.....W. D. Rundlett  
 Egg tester.....J. Carlen  
 Electric battery.....2 pats.....H. Halsey  
 Electric circuit ground detector.....F. Conrad  
 Electric conduits. Making.....A. M. Lougee  
 Electric currents. Distributing.....E. Arnold et al  
 Electric currents. Generating independent.....E. Arnold et al  
 Electric elevator.....F. J. Sprague  
 Electric exchange system. Automatic.....W. R. Binkley  
 Electric meters. Frequency compensating  
 means for.....A. G. Davis  
 Electric motor controller.....H. R. Stuart  
 Electric oscillator. Tuned.....J. S. Stone  
 Electric recording instrument.....W. C. Fish et al  
 Electric switch.....W. M. Brown  
 Electric time switch.....W. B. Coulter  
 Electrical distribution.....2 pats.....J. S. Stone  
 Electrical distribution system.....C. P. Steinmetz  
 Electrical switch.....H. & R. Lomax et al  
 Electricity meter.....P. Rouget  
 Elevator.....2 pats.....J. J. Stevin  
 Elevator cars or lifts. Safety brake for.....W. G. Mezzies  
 Ellipsograph.....E. N. Dart  
 Engine.....T. W. Johnston  
 Engine.....E. B. Thomas  
 Engine.....O. B. Nestius  
 Engine and driving gear support for steam  
 wagons.....P. H. White  
 Engine attachment. Rotary.....C. H. Hill  
 Engines. Electrical igniter for gas.....E. J. Stoddard  
 Envelop.....A. A. Rittenhouse  
 Escapement motion.....W. J. Shortill  
 Evaporating distillers' residues. Apparatus  
 for.....J. M. J. Thierry  
 Evaporator.....S. S. Cook et al  
 Explosive.....L. McDaniel  
 Extinguisher.....N. Galipeau  
 Eye.....C. C. Mund  
 Fan. Ventilating.....W. Burrows  
 Fare register.....T. S. Huntington  
 Farm gate.....E. Bowsher  
 Feed water heater.....C. H. Atkins  
 Fence post.....C. H. Hutchings  
 Fence post and telegraph pole.....I. M. Warner  
 Fertilizer spreader.....J. R. & C. E. Porter  
 Fibrous material. Producing molded articles  
 from.....J. W. Strehli  
 File binder bar.....W. H. Kell  
 File or drawer for card indexes.....P. H. Yawman  
 Filter.....A. A. Davidson  
 Filter. Oil.....H. F. Maranville et al  
 Filtering or cleaning plant. Water.....H. C. Schlichter  
 Fire alarm box keys. Keeper for.....C. E. Gibson  
 Firearm head rest.....J. Marsland et al  
 Firearm sight.....R. H. Smith  
 Fire extinguishing tube. Dry compound.....A. & T. R. Hopper  
 Fire lighter or like blocks into solutions.  
 Dipping.....E. Pollard  
 Fire shield. Portable.....E. D. Cundell  
 Fires in oil tanks. Means for extinguishing.....W. F. Gaul  
 Fish cleaner and scaler.....J. Jacobsen  
 Fish cleaning device.....W. A. Jacoby  
 Fishing float.....J. F. Marsters  
 Flasher. Automatic electromagnetic.....P. E. Oswald  
 Flashing apparatus for use in taking photo-  
 graphs.....J. Schmidt  
 Flour. Making.....J. E. Mitchell  
 Fluid meter recording apparatus.....G. X. Wittmer  
 Folding stand.....C. S. Stevens  
 Foot plate.....F. F. Hussey  
 Furnace bosh plate. Blast.....J. C. McCausland  
 Furnace for burning powered fuel.....W. Westlake  
 Furnace for glowing molds for metal castings.....H. Elmquist  
 Furnace grate. Sectional.....F. I. Jones  
 Furnace or hearth.....H. Schwiebus  
 Gab.....J. W. Thompson  
 Game and puzzle block.....R. W. Mansfield  
 Game apparatus.....F. Sievers et al  
 Game apparatus.....E. S. Ellis  
 Garment holder and trousers stretcher. Com-  
 bined.....F. R. Walter  
 Garment supporter.....L. Wertheim  
 Garment supporter.....E. Wolfbauer  
 Garments, &c. Fastener for.....H. Faulkner  
 Gas burner.....S. Traubel  
 Gas generator. Acetylene.....J. D. Forsyth  
 Gas generator. Acetylene.....A. S. Phelps Jr  
 Gas generator. Acetylene.....G. E. La Cell  
 Gas igniter.....H. Bergner  
 Gas pipe cut off valve.....H. V. Malott et al  
 Gas producer.....R. C. Peabody  
 Gas retort charging apparatus.....G. A. Brondier  
 Gas saving attachment.....P. Riess et al  
 Gasoline engine.....E. E. Koken  
 Gear. Changeable speed.....H. F. Jeffis  
 Gear. Transmission.....F. H. Lewis  
 Gear. Variable speed.....J. M. Ough et al  
 Gear. Variable speed.....2 pats.....J. M. Ough  
 Glass by stretching. Apparatus for manu-  
 facture of plate.....E. Fourcault  
 Glass cutter and marker.....H. L. Notter  
 Glass grinding, smoothing, and polishing ap-  
 paratus. Plate.....E. Bagnall  
 Glass. Leer for annealing plate.....J. W. Cruikshank

Glasses, tumblers, &c. Device for rinsing  
 and washing.....E. Witte  
 Golf ball.....L. M. Selzer  
 Governor for explosive engines.....H. H. & C. B. Segner  
 Governor. Pressure.....A. Roesch  
 Grass edge trimmer and sod cutter.....C. A. Saeger  
 Gun.....R. C. Wolfersperger et al  
 Gun carriage.....P. de Nordenfelt et al  
 Guns to carriage axles. Means for securing  
 the pivots of.....G. Ehrhardt  
 Hackling machine.....J. P. & N. Fraser  
 Hair retainer.....M. A. Gouy  
 Hammer. Tilt.....B. C. A. M. & J. M. Schroder  
 Hammock.....O. Potter  
 Handle fastening.....I. Nellenbogen  
 Harrow tooth and means for supporting same.....J. Macphail  
 Harvester. Bean.....D. J. & J. C. Morrow  
 Harvesting machine conveyor slat.....J. W. Poindexter  
 Headers. Tilting lever handle for J. Macphail  
 Headlight for street cars, &c. Adjustable.....G. F. Chapman  
 Heating apparatus.....C. M. Kemp  
 Heating apparatus.....A. M. Roemer  
 Hoist.....E. Y. Moore  
 Hoisting apparatus.....C. L. Kennicott  
 Hoisting apparatus.....J. W. Johnson et al  
 Horses from vehicles. Device for clearing.....L. L. & J. W. Fox  
 Horseshoe.....T. F. Judge  
 Hose, &c. Supporter for.....M. Stern  
 Hot air furnace.....F. I. Jones  
 Index.....H. J. Van Gelder  
 Induction coil or like instrument.....O. H. Huebel  
 Inflatable devices. Closure for.....W. F. Lott  
 Inhaler.....S. A. Morse  
 Insulator for high potential lines.....C. E. Barry  
 Insulator. Section.....J. M. Andersen  
 Insulator. Third rail.....E. Gonzenbach  
 Internal combustion engine or motor.....C. E. Henriod  
 Jar cap or cover.....D. B. Smith  
 Jar cover fastening.....J. S. Giles  
 Jars, &c. Cover or stopper for preserve.....J. M. Cairns  
 Joist hanger.....H. W. Avery  
 Journal box.....F. W. Sherman  
 Journal box.....S. & S. J. Reynolds  
 Kettle or pot scraper.....A. M. Schiele  
 Key remover.....H. M. McCall  
 Lacing hook. Covered.....F. N. Look et al  
 Lamp carbon holder. Electric.....P. F. Maines  
 Lamp. Electric.....M. W. Hanks  
 Lamp. Electric.....A. J. Wurts  
 Lamp. Electric arc.....H. Cuenod  
 Lamp. Gas incandescent.....2 pats.....D. S. Williams  
 Lamp glower. Electric.....H. N. Potter et al  
 Lamps or motors. Electric current controller  
 for incandescent.....H. A. Strauss  
 Lantern.....H. R. Menzie et al  
 Lantern.....J. T. Casey  
 Lantern globes. Manufacture of.....A. B. Houghton  
 Last. Shoe.....J. O. Caldwell et al  
 Lawn sprinkler.....J. Smith  
 Leather stretching device.....J. Schneider  
 Lightning arrester.....H. R. Sargent  
 Linekiln.....S. W. Shoop  
 Linotype machines. Matrix distributing mech-  
 anism for.....C. A. Albrecht  
 Liquid gage.....G. S. Thompson  
 Liquid purifier.....E. Gathmann  
 Liquid raising apparatus.....A. Scholl  
 Liquid raising apparatus.....V. Schwaninger  
 Loom warp stop motion.....E. S. Stimpson  
 Magnetic and mechanical brake. Combined.....J. F. McElroy  
 Magnetotherapeutic apparatus.....J. Burry  
 Mail package box.....W. H. Mulloy  
 Massage apparatus. Ear.....M. R. Hutchison  
 Mattress stuffing machine.....W. S. Allender et al  
 Measure for builders. Angle.....F. Nolf  
 Measuring and drafting device. Garment.....C. Ryan  
 Measuring instrument. Electrical.....E. Weston  
 Measuring the energy of three-phase alternat-  
 ing current circuits.....2 pats.....F. Conrad  
 Meat tenderer and seasoner.....C. G. Childers  
 Metal and making metallic hydroxids. Reduc-  
 ing.....H. S. Blackmore  
 Metal rod or bar conveyer.....J. R. George  
 Metering. Multirate.....E. Oxley  
 Mop head and wringer.....G. G. Glenn  
 Motor speed limiting device. Series.....L. A. Tirrill  
 Muffler.....C. E. Christman  
 Music rack or stand.....E. B. Straight  
 Musical instrument action. Stringed.....H. Steenbock  
 Musical instrument. Mechanical.....E. S. Votey  
 Nasal irrigator.....C. H. Pattison  
 Nipper. Hoof.....J. Emanuel  
 Nut and bolt threading machine.....F. P. Burnett  
 Nut. Lock.....A. C. Foot  
 Nut lock.....W. F. Collins  
 Nut lock.....J. Walsh, Jr  
 Nut lock.....W. E. Ball  
 Nut lock.....Z. Frei  
 Nut lock.....J. E. Montgomery  
 Nut locking device. Screw.....A. Budde  
 Nut wrench.....A. S. Gray  
 Office indicator.....W. H. Mercer  
 Oil for calming waves. Means for conveying  
 oil.....C. L. Hillman  
 Olive crusher and pitter.....W. L. Morris et al  
 Ordnance disabling lock.....C. A. Seoane  
 Organic peroxid.....R. H. Page  
 Oven door. Baker's.....T. Kleinhans  
 Overalls.....L. A. Guiterman  
 Oxidizing furnace.....J. E. Greenawalt  
 Packing. Metallic red.....R. C. Lochridge et al  
 Paper bag machine.....W. Brown  
 Paper basket.....J. F. Donley  
 Paper fixture. Toilet.....W. M. Davis  
 Paper holder and cutter. Toilet.....G. M. Rust et al  
 Paper machine drier spring roll.....B. J. Reardon  
 Paper, &c. Roller for.....J. W. Phail  
 Paths. Tool for smoothing gravel.....G. J. Hoskins  
 Patterns in exact relative position on draw-  
 plates or upon the tables of molding-mach-  
 ines. Applying.....S. H. Stupakoff  
 Patterns. Inserting or withdrawing.....S. H. Stupakoff  
 Pen with filler carried in the holder. Fountain

.....E. O. Lyte  
 Pencil box.....H. F. Longenecker et al  
 Pencil holder.....E. E. Long  
 Perforating machine stripper. Rotary.....H. S. Hewston  
 Permutation lock.....D. Churchill  
 Photographic developing apparatus.....A. Pollak  
 Photographic negatives. Apparatus for de-  
 veloping, washing, and fixing.....S. G. Livett  
 Photographic plate holder.....G. W. Arkland  
 Photographic plate holder kit.....A. Gaffney  
 Photographic plates for use in printing presses  
 Manufacture of.....S. Epstein  
 Photographing.....J. Schmidt  
 Pianos. Repetition action for.....L. Charpiat  
 Piling and wall structure. Metal sheet.....N. S. Taylor  
 Pin.....E. N. Gaillard  
 Piperidin salt and making same.....W. B. & A. Bishop et al  
 Pitman connection.....J. W. Jester  
 Planter and fertilizer distributor. Seed.....O. Tipton  
 Platen press inking mechanism.....J. Thomson  
 Platform carrier.....S. B. Peck  
 Playing ball.....E. Kempshall  
 Plow.....E. T. Robinson  
 Plow. Ditching.....P. Dooling  
 Plow. Gang disk.....E. Manes  
 Plow. Multiple or gang.....N. Sanders  
 Plow. Rotary.....J. Scott  
 Plow. Sidehill gang.....L. G. Fairbank  
 Pole. Metallic.....F. Reissner  
 Power transmitting mechanism. Friction.....G. W. Marble  
 Printing machine chase securing device.....J. Thomson  
 Printing or like machines. Apparatus for  
 feeding separate sheets of paper in.....M. T. Barber  
 Printing press inking apparatus. Changer for  
 J. Thomson  
 Printing press inking apparatus. Changer for  
 C. B. Meilen  
 Printing press inking apparatus. Platen.....J. Thomson  
 Printing press. Platen.....2 pats.....J. Thomson  
 Printing press sheet straightener.....F. S. Mathews  
 Propelling mechanism for dredges, &c.....A. N. Cross  
 Protective apparatus.....W. Kaising  
 Pulleys, wheels, &c. Device for adjustably  
 uniting the rims and spokes of.....B. Dedman  
 Pump.....W. S. McRoberts  
 Pump. Centrifugal.....E. G. Harris  
 Pump governor.....L. B. Fulton  
 Punching machine. Metal strip.....J. S. Stokes  
 Rack teeth. Machine for cutting.....H. Smith  
 Racket or battledore.....H. Smith  
 Racking off apparatus. Beer.....H. Torchiani  
 Radiator.....A. E. Laycock  
 Radiator. Electric.....J. F. McElroy  
 Railings. Tool for fixing iron.....F. G. Olanburg  
 Rail joint.....H. B. Nichols  
 Rail joint and fastening.....T. F. Davies  
 Rails or to their bases, &c. Appliance for fix-  
 ing the upper or wearing portions of com-  
 pound tramway.....W. L. Le Maitre et al  
 Railway contract box. Electric.....W. M. Brown  
 Railway. Electric.....E. W. Farnham  
 Railway fish plate and noise reducing device.....H. G. Farr  
 Railway fog signaling apparatus.....J. H. Pleasance  
 Railway rail brace.....W. E. Ball  
 Railway signal and alarm.....A. E. Coughley  
 Railway signal. Electric.....S. W. Huff  
 Railway signal. Locomotive cab electric.....E. B. Cullen et al  
 Railway switch.....S. Fierhaber  
 Railway switch.....D. S. Hoover  
 Railway tie.....G. W. Schellenbach

Railways. Apparatus for automatically block  
 signaling on.....F. B. Behr  
 Range finder.....A. A. Adams  
 Range hot water attachment.....S. R. Stines  
 Reflector.....H. C. Hawks  
 Regenerative furnace.....J. A. Drake  
 Rein support.....W. S. Neal  
 Retort furnace. Rotating and discharging.....I. L. Briggs  
 Reversing mechanism.....W. W. Tuck et al  
 Revolvers. Rear sight for.....D. B. Wesson  
 Rheostat or electric heater.....G. P. Wisdom  
 Rifle.....A. Alfson  
 River banks. Protecting.....A. F. Smiser  
 Rock drill.....J. H. Redfield  
 Rock drill attachment.....J. H. Redfield  
 Rocking chair.....P. Fitzsimmons  
 Rolling stock. Monorail.....J. A. Burns  
 Roost. Poultry.....J. M. Reid  
 Rope tip.....H. S. Durand  
 Rotary engine.....E. H. Werner  
 Rotary engine.....J. Putman  
 Rotary engine.....F. Gouger  
 Rotary engine.....G. W. Soule  
 Rotary engine. Compound.....M. E. Knight  
 Rotary engine or pump.....W. A. Morgan  
 Rug loading and stiffening device.....F. E. Kingden  
 Sad iron.....J. F. Kingwill  
 Saddle and saddle attachment. Riding.....R. E. Whitman  
 Safe.....C. A. Barber  
 Safety pin.....J. Hancock  
 Sales recording system.....M. A. Stone  
 Sap bucket cover.....F. W. Gunn  
 Sap bucket cover.....M. V. B. Ives  
 Sash lock.....H. J. Lomb  
 Sausage mills, &c. Base for.....C. W. Liebach  
 Saw. Crosscut.....C. W. Eccleston  
 Saw tooth holder.....H. A. Tracy  
 Scaffold and fire escape. Combined window.....H. R. Cole  
 Scale. Automatic grain.....A. P. MacDonald  
 Scale. Garment.....J. Nelson  
 Scraper. Ground.....P. E. Monnerat  
 Scraper holder. Cabinet.....S. Dean  
 Screw shaving machine.....W. L. Cheney  
 Secondary battery.....2 pats.....W. Morrison  
 Secondary battery.....I. Kitsee  
 Seeding machine.....C. D. Pouille  
 Seeding machine furrow-opener.....E. Baseman  
 Self acting brake.....J. Fischer et al  
 Shaft. Flexible.....H. W. A. Fette  
 Shampooing hood.....W. J. H. Walters  
 Sheathing. Metallic surface.....G. D. Coleman  
 Sheet metal brushing machine.....C. G. Wemlinger  
 Shelf support. Book.....J. R. Baker  
 Shingle machine. Band saw.....H. A. Park  
 (Continued in February Number.)

Canadian Patents may now be obtained by  
 the inventors for any of the mechanical inven-  
 tions named in the foregoing list, provided  
 they are simple, at a cost of \$30 each. If  
 complicated the cost will be a little more.  
 For full instructions address Inventive Age  
 Publishing Co., 918 F Street N. W., Washing-  
 ton, D. C.  
 Foreign patents may also be obtained in cer-  
 tain other countries.

**FREE!** Send us 2 cents to  
 pay for postage and  
 we will mail you a  
 valuable copyrighted book, "How to obtain  
 Patent, Caveat, Trade-Mark and Copyright  
 Protection, with Decisions in Leading Patent  
 Cases" entirely free of charge. Address:  
**INVENTIVE AGE PUBLISHING COMPANY,**  
 (Dept. P.) WASHINGTON, D. C.

## Attention Inventors!

### LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish up-to-date lists of manufacturers in any line of  
 industry.

Charge, fifty cents to one dollar, depending on size of list.

In ordering, please state class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.

**BICYCLES BELOW COST**  
**5000** high grade guaranteed 1902 MODELS the  
 overstock of one of the best known  
 factories of the country, secured **\$9 to \$15**  
 by us at one-half cost. **Four Models**  
**1900 and 1901 Models** High Grade **\$7 to \$11**  
 Catalogues with large photographic engravings and  
 full detailed specifications sent free to any address.  
 We **SHIP ON APPROVAL** to anyone in U. S.  
 or Canada without a cent in advance and allow  
**10 DAYS FREE TRIAL** You take  
 absolutely  
**no risk** in ordering from us, as you do not  
 need to pay a cent if the bicycle does not suit you.  
**500 SECOND-HAND WHEELS**  
 taken in trade by our Chicago retail stores, **\$3 to \$8**  
 standard makes, many good as new.  
 Tires, equipment, sundries, sporting goods of all kinds at 1/2 regular  
 price, in our big free sundry catalog. A world of information. Write for it.  
**RIDER AGENTS WANTED** in each town to ride  
 and exhibit a sample  
 1902 model bicycle. In your spare time you can make **\$10 to**  
**\$50** a week besides having a wheel to ride for yourself.  
 WE WANT a reliable person in each town to distribute catalogues for us in  
 exchange for a bicycle. Write today for free catalogue and our special offer.  
**J. L. MEAD CYCLE CO., Chicago, Ill.**



# A Remarkable Offer

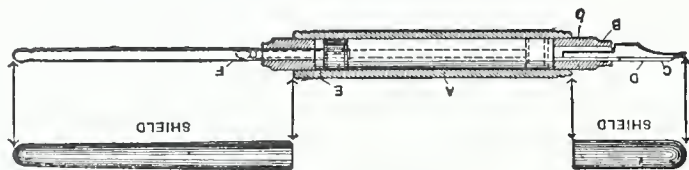


## The "POST" SELF FILLING FOUNTAIN PEN.

No Filler. No Soiled Fingers. No Lost Time. Simple and Perfect.

### THIS IS ITS CONSTRUCTION

IT IS AWAY AHEAD OF ANY OTHER PEN MANUFACTURED BECAUSE OF ITS SELF-FILLING AND SELF-CLEANING FEATURES.



BEING THE ONLY ONE MANUFACTURED HAVING THESE CONVENIENCES.

We will send this famous pen, postpaid, and one years subscription to "The Inventive Age," for \$2.00.

Every Inventor in the country needs The Inventive Age, and everyone needs a pen. Here's your chance to get a bargain.

There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the 'Post' has secured. We have testimonials that a million dollars could not buy. In the list will be found leading men in politics, finance, law, religious movements, literary men, bankers and business men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the 'Post' and in terms of praise simply unqualified. Send for list of testimonials.

Address: **THE INVENTIVE AGE Publishing Co.** 918 F St. Northwest, Washington, D. C.

### Our Great Popular Offer!

...A...

### Complete Electrical Library

By PROF. T. O'CONOR SLOANE.

...A...

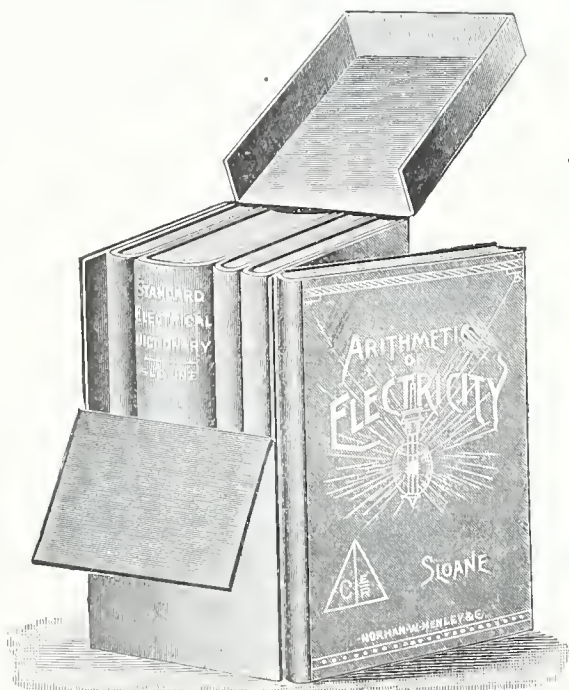
\$7.00

Library

for

\$5.50.

Comprised by  
the following  
books:



5 Volumes,

1300 Pages,

Over 450

Illustrations.

Electricity Simplified..... Price 1.00  
Arithmetic of Electricity..... " 1.00  
Electric Toy Making..... " 1.00  
How to Become a Successful  
Electrician..... " 1.00  
The Standard Electrical Dict'y 3.00

**Our Great Special Offer.**—We will send prepaid, the above five volumes, handsomely bound in blue cloth, with silver lettering, and enclosed in a neat folding box, as shown in the illustration, at the *Special Reduced Price* of \$5.50 for the complete set. The regular price of the five volumes is \$7.00

Order direct from us while the opportunity lasts. Any of the above books sold singly at the published prices. You save \$1.50 by ordering the complete set from us. Sent prepaid on receipt of price. Remit by draft, postal money order, or express order.

Address: **THE INVENTIVE AGE P. Co.,** 918 F Street, N. W., Washington, D. C.

### MECHANICAL - - - - MOVEMENTS, Powers, Devices and Appliances:

By Gardner T. Hiscox, M. E. Price \$3.00.  
Author of "Gas, Gasoline and Oil Engines."

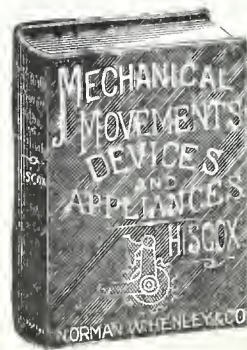
Large 8vo.

Over 400

Pages

Handsomely

Bound in Cloth.



1,649 Specially  
Made

Illustrations

With Descrip-  
tive Text.

PRICE, \$3.00

**A** **DICTIONARY** of Mechanical Movements, Powers, Devices, and Appliances, embracing an illustrated description of the greatest variety of mechanical movements and devices in any language. A new work on illustrated mechanics, mechanical movements, devices, and appliances, covering nearly the whole range of the practical and inventive field, for the use of Machinists, Mechanics, Inventors, Engineers, Draughtsmen, Students, and all others interested in any way in the devising and operation of mechanical works of any kind.

Sent to any address on receipt of price.

Address: **INVENTIVE AGE Pub. Co.,** 918 F. St., N. W., WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

# THE Inventive Edge

AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 2.

WASHINGTON, D. C.—FEBRUARY, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

## = = = Cannonading The Clouds. = = =

FOR YEARS, reports from United States Consuls have come into the State Department at Washington, on the subject of the prevention of hailstorms by the use of cannon, as practiced in Italy and France. The State Department has published these reports as items of news in its Advance Sheets of Consular Reports, without, however, expressing an opinion, one way or the other, as to the value of cloud-cannonading to ward off hailstorms. When the first reports were published, the Chief of the Weather Bureau at Washington felt called upon to express his disapproval of the publicity given to them, it being his opinion that a hailstorm could no more be prevented than it was possible for man to induce rain to fall. We all remember the rain-making experiments made about fifteen years ago, which were conducted under Congressional authority and with the aid of a substantial appropriation. They resulted in failure; but who can say that under different conditions and with other means success may not be reached? At any rate, the failure of attempts to extract rain from the clouds furnishes no argument against the efforts made in Southern Europe to prevent hailstorms by cannonading the clouds, for it is not a matter of theory in that case but actual, successful practice.

The International Congress for protection against hail has lately issued its official report. Seven years ago a destructive hailstorm was said to have been converted into a fine rain fall by the employment of a number of mortars. In 1900, nearly 12,000

cloud-firing stations were represented at the congress held at Padua, Italy. In a single department, that of the Rhone, 45,000 acres of vineyards are protected by 834 cannons. In 1900, twenty-one storms were cannonaded before the wine-making season. On one occasion, 10,000 shots were fired during one storm. They were said to have produced the desired effect. The layman will begin to wonder if the cost of cannonading on such a colossal scale does not overbalance any injury the vineyards might sustain from hail.

The majority of the reports sent in from the various testing grounds favor the use of cannon for protection against hail. One man declares, "The obser-

vations made permit us to form a positive judgment of the efficacy of the firing. It is certain that where cannon have been used in time, the most satisfactory results have been produced." Farmers and wine-growers are unanimously in favor of cannon. They declare that since the formation of their anti-hail organization no hail has fallen over the protected area, while it has fallen in neighboring communes, but without intensity.

A farmer says, "The great savants are not learned enough to explain the phenomena which are produced by the firing against the hail. I, who am not a savant, will not try to discuss it, but I will say that among us there are no more unbelievers. Confidence in this system of defense is complete."

Mr. Lewis Nicolas, of the Gironde, says: "A very heavy storm arose at 6 o'clock in the evening. In a quarter of an hour firing began, two or three shots a minute, and when the storm reached that spot it ceased and passed toward the southwest. Our territory received only a few drops of rain. \* \* \*

The population of our commune and of the neighboring communes, who were hostile to the firing, completely changed their minds after this experience. Everybody was convinced that our rapid and regular firing preserved us from the disaster which St. Emilion suffered. Without daring to formally affirm, as our country people do, that we stopped the storm, the author believes that the firing contributed to the dispersion, and he is convinced that if the cannon had been as regularly fired at St. Emilion as at Pommerol, they would have avoided, or at least greatly diminished, the disaster."

The report proceeds to say that faith in the cannon increases with the use of the guns. The wine-growers have vanquished the phylloxera, the mildew, and the black rot, but the most redoubtable enemy is hail, which every year destroyed from \$16,000.-



000 to \$24,900,000 of property. "Today the cannon appears to have combatted the hail, to have arrested the thunder, the lightning, and the wind, to have dispersed the clouds, and to have made the sun shine serenely. We cannot explain it scientifically, but let us continue to use these means until we have something better, and not wait for scientific explanation which will perhaps explain nothing."

A number of cannon were presented to the congress for examination. The report says: "The most remarkable one, the one which seems likely to revolutionize agricultural artillery, is the powderless cannon of Maggiora & Bianchi."



In our opinion this problem encountered almost insurmountable obstacles in the use of powder cannon. It was necessary to find an explosive not only absolutely free from danger and easily handled, but which would also produce the same effect as powder. Acetylene gas mixed with air more than solved this difficult problem.

The cannon (an illustration of which is here given) which permits the use of this explosive consists of a cylindrical chamber of homogeneous iron (A) provided with a special tube (B), through which passes the mixture and an electric lighter (C). This is the chamber where the explosion occurs.

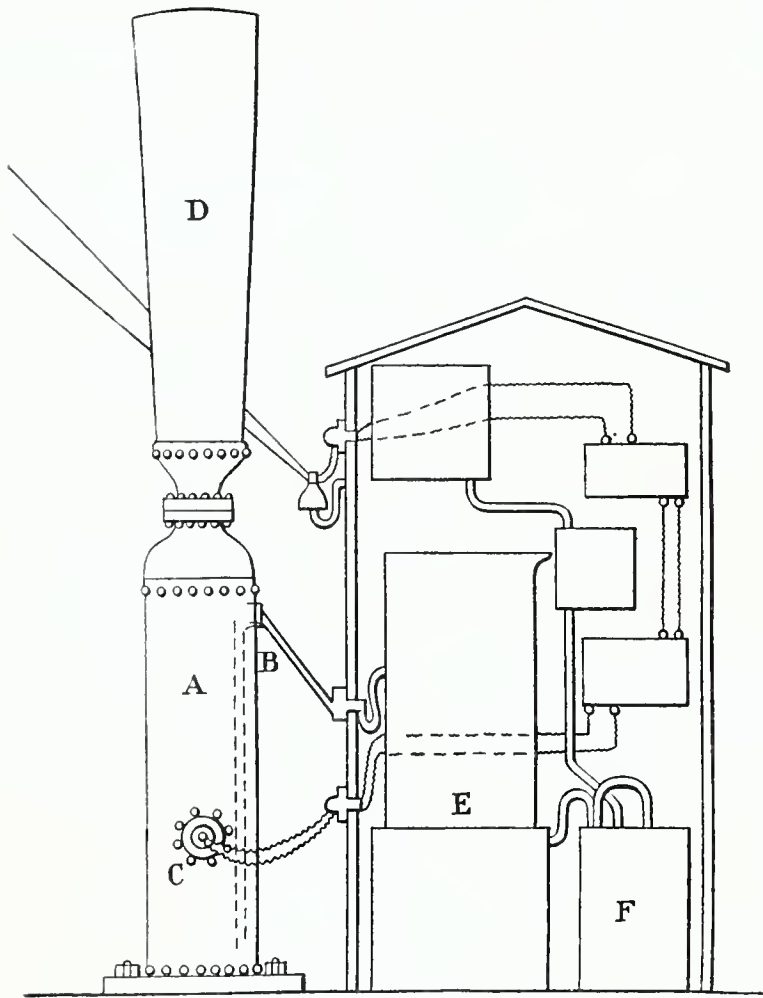
This cylinder is surmounted by a dome (D), formed by a hollow hyperboloid, placed in such a way as to direct the lines of force straight towards the clouds, but without permitting them to cross each other: on the

secutively without being touched, so that each cannon may be considered in a state of readiness for six months' use or longer.

When the charges are used, a supply of carbure of calcium necessary for six months (about 65 pounds) is placed in the generator, and the cannon recommences its work against the hail.

Mr. Plumandon, director of the Observatory of Puy de Dome, read an exhaustive paper and came to the following conclusions:

"Some facts which have been advanced in favor of the use of cannon prove nothing; others seem to disprove the theory, and some may serve as a foundation for the hypothesis that the cannon do afford protection. This is a great deal in such a field of effort. Enthusiasts who believe in the speedy and radical suppression of the hail will be dis-



contrary, slightly enlarging them.

The tube (B) for the introduction of the mixture is directly attached to an acetylene gasometer (E), which is fed, as needed, by an acetylene generator (F) and furnishes the mixture to the cannon.

A rocket, for lighting, and an electric escape valve complete the apparatus.

As will be seen from its simplicity, the apparatus may be placed anywhere and left for years without fear of accident either from the cannon or the explosive material, which is in the generator in the condition of a mineral absolutely inert and consequently harmless.

Suppose we had fifty cannon stationed upon a given space and connected by an electric wire so as to form one or a number of batteries terminating at one station. By simultaneously closing the circuit between a little battery of piles and the electric escape pipe or safety valve of each cannon, through the action of a single operator, every cannon is charged automatically in a few seconds. By breaking the circuit of the escape valve and closing the rocket circuit, all the cannons, or a battery of cannons, accordingly as they are stationed, are discharged at once.

This done—and it only requires about ten seconds—the circuit between the pile and the escape pipe is reclosed and the firing goes on again.

The generator, which was made expressly for this work, permits the cannon to fire over 1,000 times con-

appointed, but conservative people will be satisfied to know that the struggle against hail is not absolutely impossible. Besides, a great incentive has been given. The enthusiasm, born in Italy, has spread to France. It remains to direct it, to control it without diminishing it; in short, to make it useful and profitable. To this end, it must first be thoroughly understood that in all experiments the aim of which is to operate against nature, time is a most important factor. A great deal of money, an immense fund of energy and willingness would be lost if one yielded rashly to the natural but too human and often illusory desire to triumph at once.

After all the papers prepared for the congress had been read, the president submitted the following resolution, which was unanimously adopted:

"The Third International Congress for Protection against Hail, sitting at Lyons, after having heard the reports on the result of the firing of conical cannon and the shooting of rockets during the year 1901 in Austria-Hungary, Italy, Spain, Switzerland, and Russia, decide that the protection against hail merits the attention and the study of the learned, the confidence and the hope of the agriculturist: that the organization of cannon-firing clubs may give satisfactory results, and ought to be encouraged when they propose to protect a continuous surface of considerable extent

## THE DONVIG LIFE SAVING

= = GLOBE. = =

MUCH interest is being shown by men of maritime affairs in a life-saving apparatus invented and patented in this and several foreign countries by Captain Jorgen M. Donvig, whose home is in Christiania, Norway. Heretofore, important and practicable improvements in life-saving apparatus have been confined almost entirely to that class employed along the coasts; and for the rescue from those terrible accidents that often happen in mid-ocean or beyond the reach of the coast-guardsmen, there is nothing but the raft, the life-boat and the life-preserver belt. Accounts of these catastrophes are usually accompanied by the stories of smashed, capsized or ingulfed boats and rafts, or if perchance they get safely away, of tales of exposure and want, all going to show that the apparatus carried by shipping is still in its crude state when compared to the progress

have sufficient room for food and drink, and at the same time occupy as little space as possible on ship board.

Ever since that time he has carefully studied and experimented to provide a structure wherein these apparently irreconcilable requirements might be harmonized to as great an extent as possible. As a result, the hereinafter described patented invention has been evolved, which, while being a distinct departure, is anything but a "freak" idea; for a full-sized float has been built and subjected to most trying ordeals, which it has weathered with entire success.

The illustrations herewith presented show respectively the apparatus as it appears when on the water, and a sectional view through the same to make plain the arrangement of the interior. It has been very aptly termed the "Globe."

The invention consists of a round



made in other lines. Some years ago it was the unfortunate lot of Captain Donvig, as master of a large ship, to experience one of the saddest shipwrecks that has ever occurred along the coast of Virginia. It presented to him in the most forcible manner possible, the need of floating apparatus that would not be subject to the risks of boats in launching, and that would carry a comparatively large company in safety without regard to the state of the weather and without subjecting its passengers to exposure. He also realized that such apparatus must

shell made from light steel plates and surrounded by a cork belt. It has a flat bottom divided into four tanks which together hold 200 gallons of fresh water. This fresh water acts as ballast, and as each tank is emptied, sea water is pumped in as ballast. Around the interior of the Globe are a series of lockers which act as seats, there being seating accommodation for sixteen men. There is padding at the back for persons to lean against, and should the sea be so rough that the Globe is pitching about, they can be strapped to their seats. In these



lockers can be stored the preserved food and other articles for the use of a ship-wrecked crew. Two hammocks can also be slung. Ventilation, is of course, very important, and Captain Donvig has a most ingenious contrivance. In the centre of the Globe is a large telescopic tube which, when the Globe is clear of a sinking vessel, is raised so that there is a free current of air into the interior. To meet any inadequacy in this respect, the inventor has an air pump attached to the ventilator, so that when additional air is needed, one of the occupants simply turns the handle and a very free supply is drawn in. In a very rough sea, when the top of the ventilator is open, spray might get into the Globe, but this possibility has been

must always be kept bow or stern heading the sea, otherwise they are liable to capsize, whereas the Globe, having neither bow, stern nor broadside, cannot possibly capsize.

The Globe, which is eight feet in diameter, occupies 64 square feet of deck space, whereas an ordinary lifeboat occupies 143 square feet. These Life-Saving Globes can be placed across the upper deck of large steamers in sufficient numbers to save all the passengers. Should the bottom of the Globe be smashed upon the rocks, there are still the bottoms of the water tanks which would keep the craft afloat.

On Friday, October 24, 1902, a very interesting demonstration of the value of the apparatus was made in Dover

wind. The Globe rode over the broken seas quite steadily. She was ballasted to equal the weight of sixteen men. The tug rolled heavily, shipped seas fore and aft, the spray going over the funnel, whilst the Globe was always on the trough or the top of the sea quite upright, no spray going over it that would at any time have prevented the ventilator being opened. The tug then towed the Globe into the Bay out of the broken water, when Captain Donvig, the Coxswain of the Life Boat, and two seamen, got into the Globe. She was then towed again into the broken water east of Dover, and the tug was then let go. The lug-sail of the Globe was rigged, two men remained inside whilst Captain Donvig and Harvey Westbrook, seaman, were outside and sailed the Globe into Dover Harbor against the tide. As practical seamen of many years' experience, we have no hesitation in declaring on oath that no ship's lifeboat, although capably manned, that had broached to in such a sea as the Globe had passed through, could possibly have lived, while in the Globe those inside would have been perfectly safe and dry, and in no danger of perishing if left drifting about in case of wreck, no matter for how long a time, whilst the provisions and water, of which she carries a supply for some weeks, lasted."

These statements appear to bear out the claims made by Captain Donvig; and indeed the apparatus is now thought of so highly that George Hammond & Company, of Dover & Deal, England, have interested themselves in it to bring the invention before the public. It would seem to be of the utmost value, and should recommend itself to all who "go down to the sea in ships and occupy their business in great waters."

#### Railroad Car Braking.

Some engineers have sought to secure a better braking effect by using track brakes, but this is shown to be ineffective because the application of a mechanical track brake must be at the expense of pressure upon the wheels, rendering the wheel brake less effective. It is thought that the friction between the track brake and the rail is less than that between the brake shoe and the wheel, so that practically the track brake would be less effective. These objections, however, do not apply to a magnetic track brake, and a very ingenious arrangement of such a brake is described in a paper read by R. A. Park before the American Institute of Electrical Engineers. The magnetic brake does not replace the wheel brakes, but supplements them, and, in addition, supplies the braking force. The magnetic brake is suspended from suitable hangers attached to the wheel brakes. When excited, it is drawn down to the rail and, by the motion of the car, is forced backward. This applies both wheel brakes; and the parts can be so designed as to secure the maximum effect. With this system, the need of cross-rods, brake beams, etc., which in many cases have prohibited the use of the inside brakes, is done away with. By exciting this track brake from the motors, all danger of skidding is prevented, as the braking force is removed as soon as the wheels cease to revolve.

This method of braking is very

pretty. We have, first, the retardation due to the friction of the magnetic brake upon the rail. This in no way diminishes the pressure upon the wheels, so that the wheel brakes which are applied by the track brake can be as effective as if applied mechanically. We have, moreover, the retardation due to the back torque of the motors when operated as generators.

It would seem hard to improve upon this system except by using the motors themselves for braking, as indicated above. The author states that the efficiency of the magnetic brake, under various conditions of service, far exceeds that of any other system for the retardation of trains; and as this system can be combined with the heating system of the car, it will doubtless be given a thorough trial by many electric roads.—*Electrical Review*.

#### Heating Machine Shops by the Fan System.

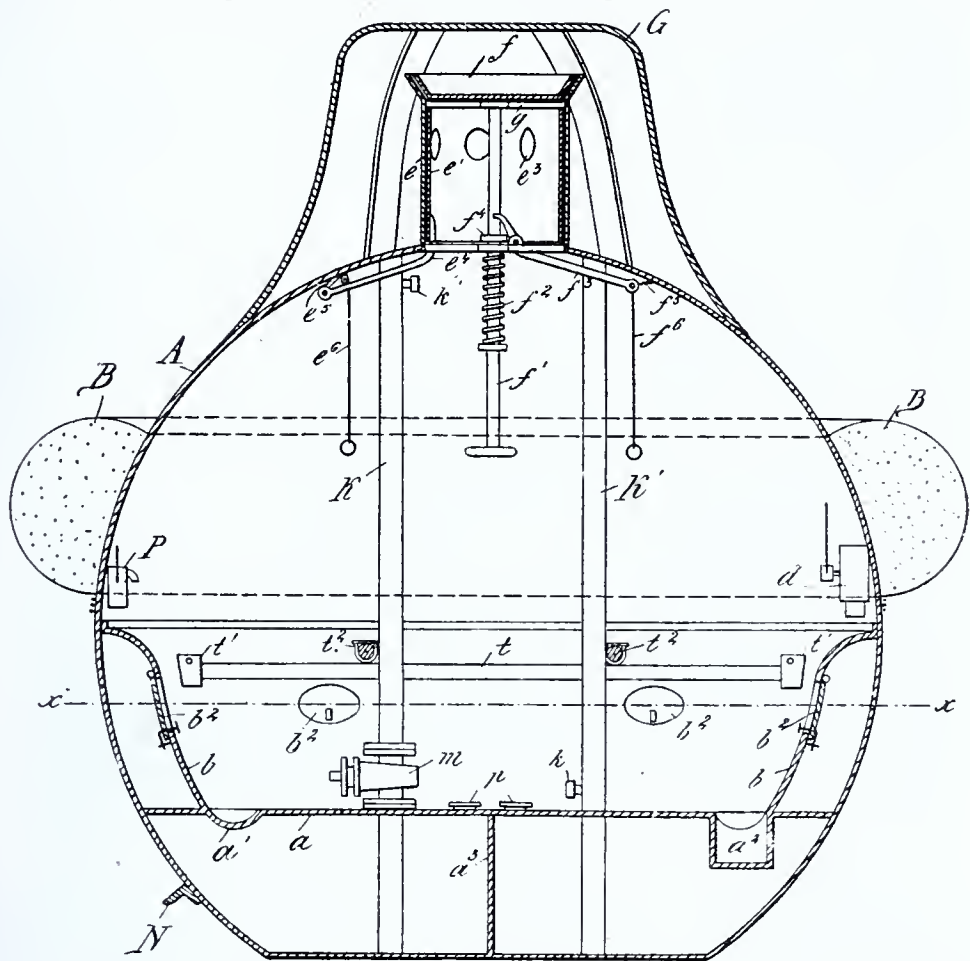
The fan system was first applied in heating the works of the Boston Rubber Shoe Company, at Malden, Mass. In 1873, the writer, while employed by one of the prominent blower manufacturers as consulting engineer, was engaged in making a series of practical experiments with a view of determining some of the laws and coefficients of heat, and the capabilities of the hot blast system, then used only for drying purposes. The air, heated by the apparatus with which the experiments were made, was discharged directly into the main office and was utilized for warming and ventilating.

One day Mr. E. S. Converse, president of the Boston Rubber Shoe Company, calling on Mr. Sturtevant, and having his attention called to what we were doing, was impressed with the results he saw and felt, and suggested that the system be applied, in an experimental way, to two rooms at his factory, each 200 feet long, 60 feet wide, and 18 feet high.

This suggestion was carried out, and the results proved so successful as to justify the adoption of the system as the method of heating a new factory of the same size, but five stories in height, where especially designed apparatus was installed. From this beginning the use of this system has rapidly increased until, at the present time, it probably is safe to say that nine-tenths of all the large modern shops are using some application of it.

With this system, a fan blower, or an exhausting fan, of suitable design, is located at any desirable place within or without the building. At the discharge outlet of the blower, or the inlet side of the exhauster, a proper amount of steam heating surface is placed, in the form of coils, cast-iron sections with vertical pipes of steel, or any of the various forms of cast-iron radiators, enclosed in steel plate casings or brick chambers and connected with the fan. At the discharge outlet of the fan should be a main warm air duct from which will lead various branches, properly designed and located, with outlets for the most efficient distribution of the warm air. For supplying the heating coils, live steam may be furnished from the boilers, or exhaust steam from the engines driving the works. The power for driving the fan may be supplied by a steam-engine, electric motor, or belt transmission from main shafting.

The cost of installing a fan system is very often less than the installment of a system of direct or indirect steam heating, or hot water heating, of equal effectiveness. The determining quantity in the cost is the amount of galvanized iron air distributing pipe, which is a varying quantity in shops of the same size and exposures, depending upon the existence and location of party walls or office rooms, and the location of the apparatus—*Cassier's Magazine*.



met by the inventor—a suction pipe being provided; and by the simple movement of a handle backwards and forwards the water is ejected. It is also possible to sail before the wind. By getting outside the Globe and standing on the belt, where, of course, plenty of hold can be obtained, one of the crew can rig up sails, which are all stowed away in the interior, and a very ingenious rudder can be affixed, worked from the inside. While sailing, a contrivance inside is so worked that a centreboard keel can be lowered to steady the Globe. Wound around the exterior is 100 fathoms of cable with an anchor attached, and by unscrewing a bolt inside, the anchor can be dropped, which will thus hold the Globe stationary.

In cases of emergency, the crew and passengers enter the Globe through three water-tight doors, and any person can clear the apparatus from the fastenings by pulling a rope inside, when a ship is sinking. The form of the Globe prevents it from being entangled and drawn down by the sinking ship, which is liable to happen to boats in heavy weather. It is claimed that the Globe can never be swamped, and that it will carry refugees safe over bars and breakers, where a lifeboat cannot live. Ordinary boats

Roads, England, in the presence of a party of gentlemen, among whom were representatives of several foreign countries, as well as men of great experience in maritime affairs. The place selected was considered one which would thoroughly try the apparatus because of the vicinity of Goodwin Sands. Among the experiments Captain Donvig allowed twenty men to get inside the Globe, while several more stood around the belt, but this did not affect its stability.

The officials present were quite enthusiastic in their praises of Captain Donvig's Life-Saving Globe, which must prove of the utmost value. Three similar Globes to the one experimented with can be stowed on board a vessel in the space occupied by one ordinary ship's lifeboat. On November 18, 1902, a trial was made in a heavy gale of wind, as explained in the sworn statement of practical seamen, and of which the following is an extract:

"We do hereby certify that we did on November 18, 1902, go out of Dover Harbor in the tug 'Lady Vita' when she towed out the Donvig Patent Life Globe. It was blowing a gale from the east with a very heavy sea and dangerous breakers, caused by the strong flood tide running against the

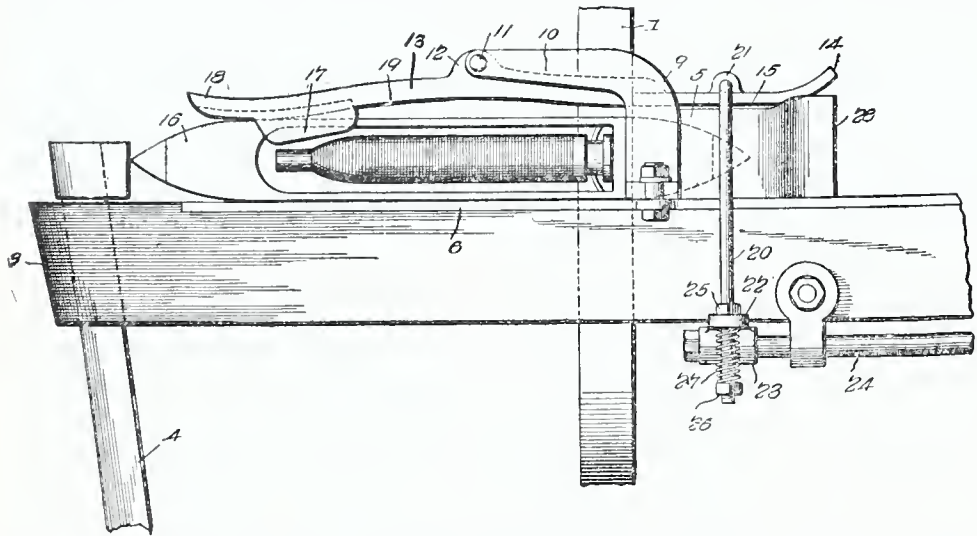


# CLEVER NEW PATENTS.

Shuttle Check.—Journal Box.—Car Coupling.—Flying Machine.  
Electrically Protected Structure.

## Shuttle Check.

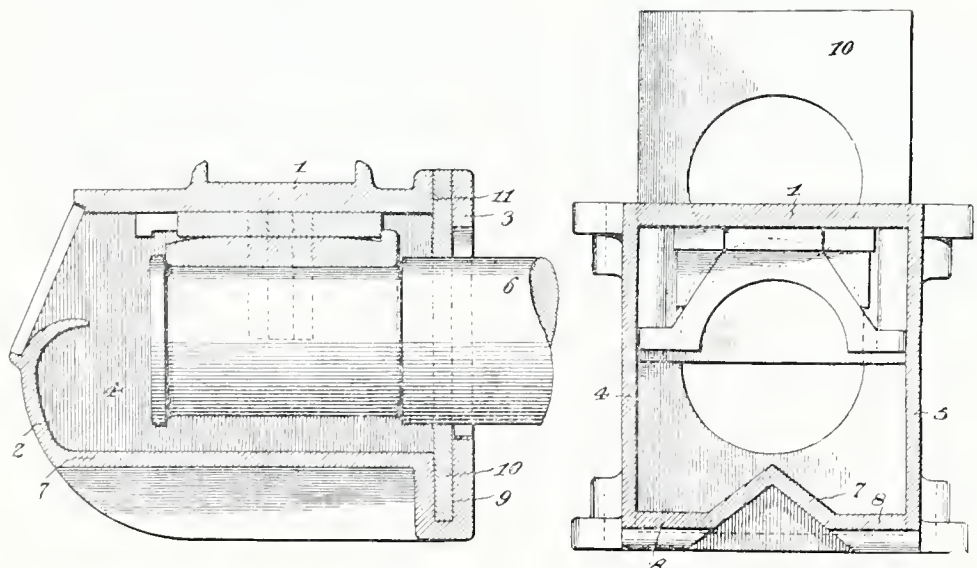
A novel form of shuttle-check for looms has been devised by John C. Bryan, of Augusta, Georgia. The object of the invention is to provide simple and efficient means for positively holding a shuttle at opposite sides of the loom, so that it will be held in true alinement when successively shot and released at the proper time by automatically operating mechanism co-acting with filling



mechanism. The attachment consists in the combination with a shuttle-box, of a top-oscillating pressure plate 13 pivotally mounted above the box, and having its outer end bearing upon the shuttle, whereby the shuttle will be shoved down and stopped at approximately its proper position in the shuttle box. When the shuttle is in the box, as shown its outer nose is in contact with the picker stick 4. The normal position of the plate 13 is at an upward incline toward the race with the outer end depressed. The shuttlenose striking said outer end elevates the same, and the plate then assumes a horizontal position as illustrated. A tension rod 20, is attached to the inner extremity of the plate 13, and has adjusting nuts 25, 26, on the lower end thereof. A rock shaft 24, is employed having an ear 22, through which the lower end of the rod 20 extends, the upper nut having contact with the upper side of the ear, while a spring 27, is arranged on the lower end of the rod between the ear and the nut.

## Journal Box.

In certain patents formerly granted to Mr. George W. Lewis and Mr. LeRoy C. Godwin, of Portsmouth, Va., there are shown journal boxes, in which the dust guard is arranged in a pocket formed of the outer rear wall and an inner rear wall. The floor is provided with a ridge of the shape of an inverted V, having its rear portions curved and merged in the inner rear wall and the side walls of the box. A patent just issued to Mr. Lewis covers an improvement in the original structure. In the present invention, the inner rear wall and the inner curved portions of the floor and side walls referred to, are dispensed with. Instead, the floor of the box is constructed with a ridge in the shape of an inverted V extending longitudinally of the box from the front wall thereof to within a short distance of the rear wall, (see the part numbered

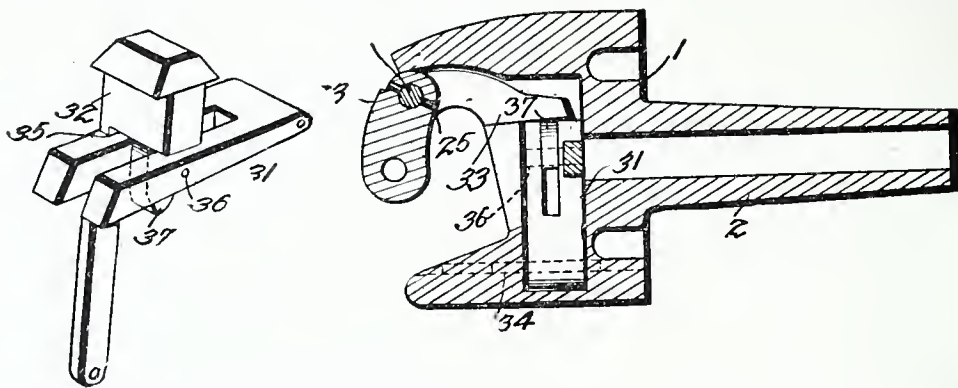


7) the space between the rear wall and the inner vertical surface of the end of the inverted V-shaped ridge, serving in conjunction with an entrance slot in the top of the box, as a pocket for the reception of the dust guard 10. As a result, the inner rear wall is dispensed with and a journal box is produced, which is greatly simplified over previous constructions, and is capable of being manufactured much less expensively and more easily.

## Car Coupling.

An improvement in car couplings has been patented by Henry H. Marshall, of Lincoln, Nebraska, who states that his object in making the invention is to provide a simple and comparatively inexpensive coupling, capable of coupling automatically and adapted to be readily set for automatic uncoupling. It comprises a drawhead having the usual pivoted knuckle, and a transverse block 31, pivoted at one end to and within the drawhead and arranged to swing upward and downward and adapted to engage the arm of the knuckle. It is also provided with a recess to receive the vertically movable coupling pin 32, which is connected to the block so that on raising said pin, the block is correspondingly elevated. A support 37, is pivoted to the block and adapted to hold

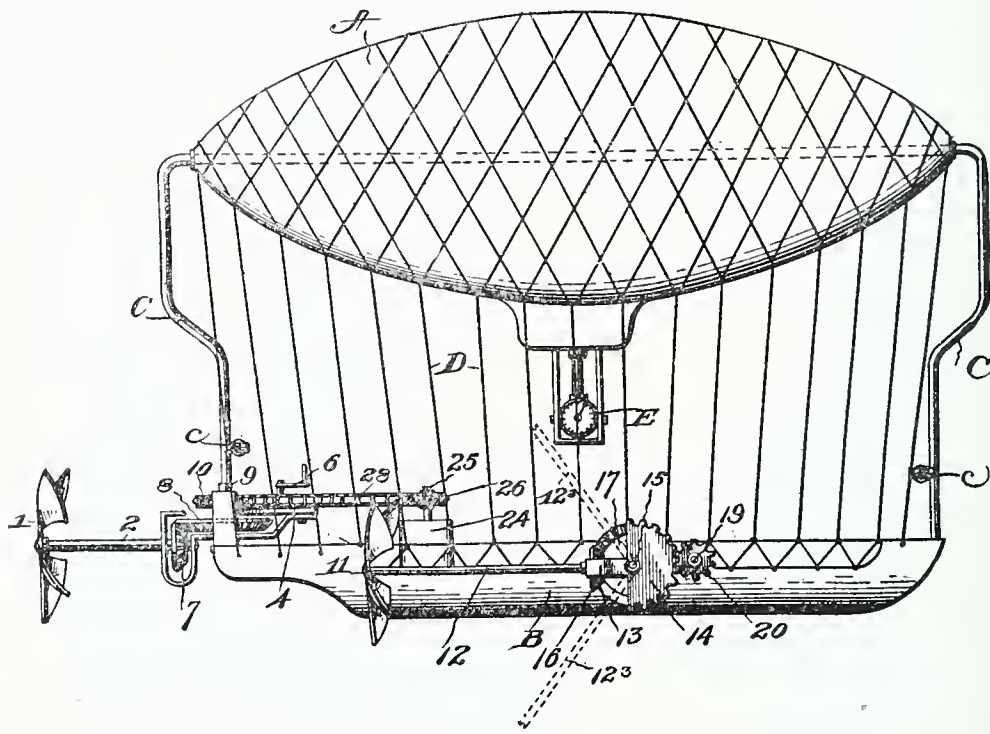
the latter in an elevated position. When uncoupling, the pin 32 is raised and the block lifted, the swinging support assuming a vertical position and holding the block in a horizontal position. The knuckle is then free to open,



and the arm 33 thereof in moving outward will strike the support 37, and swing the latter transversely and cause the block to drop. The block 31, is now in an inclined position and in closing, the knuckle arm 33 lifts the block, and after passing the latter, it drops into engagement with said arm and locks the knuckle in its closed position.

## Flying Machine.

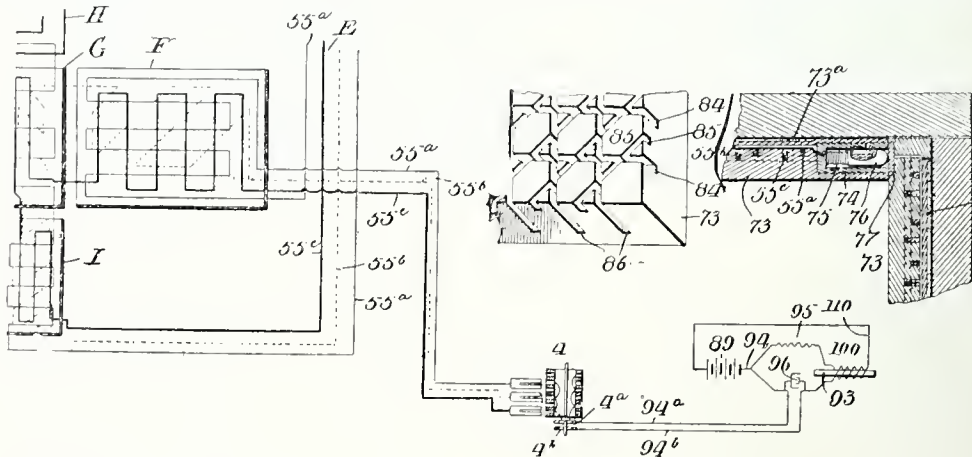
Mr. Joel T. Rice, of Hot Springs, Arkansas, has patented a flying machine and in constructing the same, he employs a balloon from which is suspended a car, provided with two sets of propellers 1 and 11. The illustration only shows one of each pair of propellers. The forward set 1 has each propeller fixed to a shaft 2, journaled in a carrier pivoted to the lower end of a shaft 9, so as to



swing the propellers, laterally in a horizontal plane. The side propellers 11 are mounted in such a manner that they may be adjusted so as to cause them to extend parallel with the propellers 1, when it is desired to forge ahead in a straight line, or if it is desired to ascend or descend, the side propellers may be moved up or down in the arc of a circle, as indicated by the dotted lines. C are tubes connecting the ends of the car to the balloon; E is a gas gage and 24 is a motor for driving the two sets of propellers.

## Electrically Protected Structure.

This invention is intended for safe-guarding vaults, safes, and the like. The block or foundation for the structure is provided with a series of grooves of different depths, extending at an angle to each other. For instance, as shown in the accompanying illustration, the grooves 86 are of the greatest depth and extend parallel with one end of the block. The grooves 84 are of less depth and extend at right angles thereto, while the grooves 85 are of less depth than the grooves 84 and extend obliquely to both of the other series. Within these grooves are placed electrical conducting wires thoroughly



insulated from each other, and so embedded that they are not subject to atmospheric changes, as shown in the sectional view. As a result, the wires in their superposed position form a practically continuous mesh. See the diagrammatic portion of the illustration. The wires are in circuit with a novel alarm device, and thus should a burglar attempt to cut through the wall, short circuits will immediately be formed, consequently sounding an alarm. The patent was taken out by Messrs. Henry W. Sutton, Walter L. Steele and Michael Coerver, of Dallas, Texas.



## = = AUTOMOBILE FREIGHT = =

### = = CARRIER. = =

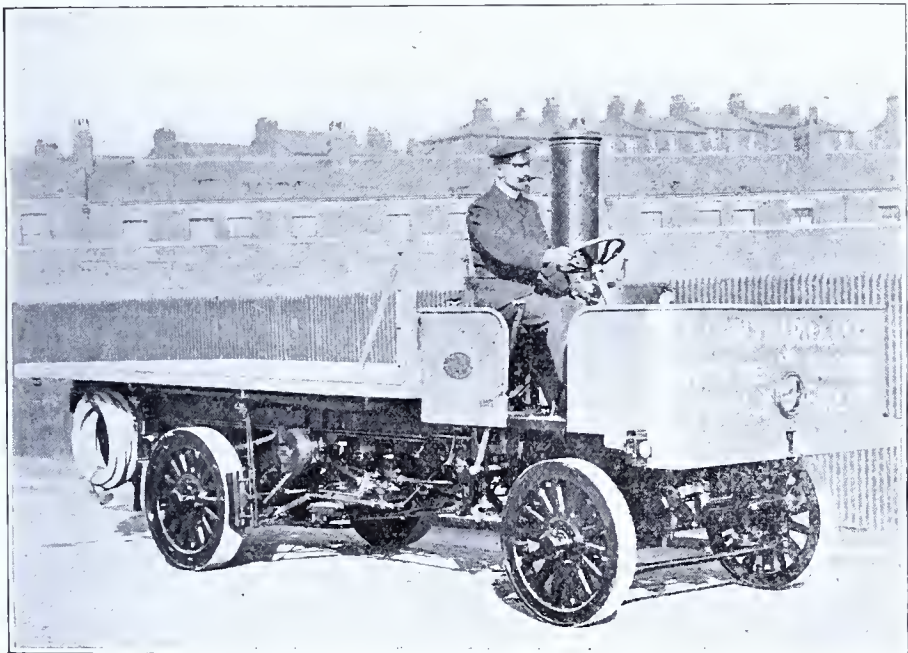
THE illustration represents a steam vehicle manufactured by Messrs. T. Coulthard & Co., Limited, Preston, England, for the purpose of hauling heavy loads on ordinary roads. This vehicle is used extensively in England, and is giving entire satisfaction among millers and shippers of grain, flour, and in fact all sorts of merchandise.

Upwards of 150 of these trucks have been sold and are in commission in Great Britain by millers, brewers, textile manufacturers, trolley car companies, city corporations, contractors, stone masons, oil companies, brick-makers, freight carriers, etc., etc. These machines are built in different sizes capable of carrying from 2 to 7 tons, and fitted with bodies of every description, from passenger omnibuses to coal tippers.

The Coulthard self propelled vehicles are steam driven, steam being generated in a vertical multi-tubular boiler and converted into work in a compound high speed engine, the motion being transmitted through

and the engine. The engine develops 30 brake horsepower, and is reversing. The arrangement of cylinders and valves is covered by patents. Silent chains form a flexible drive between the engine casing and the rear wheels, the power being taken direct to the rim of wheels, no drive going through the spokes. All the working parts are enclosed and run in oil. All vehicles are provided with two speeds, the low speed only being used for bad roads, and hill climbing. In addition to this, the power of the engine can be nearly doubled by the operation of a single lever from the driver's seat, which converts the compound engine into a double cylinder high pressure engine. The feed water pumps are in duplicate, the water tank in the rear carrying sufficient for a run of 20 miles. The exhaust steam from the engine passes to a feed water heater and silencer, and no smoke, steam or visible vapor is emitted. The heavier type of trucks average 6 miles per hour, the smaller size up to 14 miles per hour, and both will mount grades of one in nine with ease. The driver sits on the right hand side of machine, the steering wheels are in front of him, and the whole of the operating levers are within easy range.

The machine is the outcome of many



gearing and chains to the rear road wheels, by which the vehicle is propelled. Either solid or liquid fuel may be used, but coke is generally used, especially on the heavier trucks. The boiler carries a working pressure of 200 lbs., and is supported between the main steel channel frame directly behind the front axle. The engine and gearing are supported horizontally beneath the platform of the truck, and are self-contained in one casing, which is dust proof and oil tight. A special method of suspension is used, making it impossible to get gearing of shafts out of accurate mesh and alignment, however much the main frame may spring or give, due to inequalities of the road, or other causes. It is this elastic suspension, or the independent method of supporting the motor and gearing which account in a great measure for the success which has attended this vehicle, seeing that it is possible for the framework of the truck to be actually buckled or bent, without in any way disturbing the poise and working arrangement of the gearing

years' experience in this line and is fully protected in this country and abroad.

This machine will do the work of from five to six horses at very much less expense; in fact, it will cut the time more than one-half, and the expense of upkeep is very much less.

There is but one machine of this make at present in the United States, and that is in practical operation in Boston, controlled by Mr. John Gardner, the sole agent for T. Coulthard & Co., Limited, in the United States.

#### New Covering for Roads

French journals speak of a substance which, when placed upon roads, does away with dust and mud. The composition is of interest at present, when so many trials are being made with oil, tar, etc. It consists of the mixture of scoria from a blast furnace and tar. The inventor claims that the preparation, carefully pressed down with heavy rollers, renders the surface of the road impervious to water, and that vehicles can pass at any rate of speed without the least inconvenience from dust or mud.

#### Corn as a Fuel

Substitutes for coal have for many years commanded attention, and especially so during the past eight or nine months in the United States, with coal prices at abnormal figures as a result of the anthracite miners' strike last year. Peat and briquetted sawdust, wood, oil and many other substances, have been under consideration, and among them also corn, this last particularly having been spoken of as something quite new, though, as a matter of fact, corn has, for a long time, been used as fuel in the farming districts of the western sections of the United States, and that, too, with very satisfactory results. In a general way, it was recognized there that when corn was abundant and cheap, and coal was expensive, the former made a cheaper fuel than the latter, although no scientific determination of their relative efficiency had been made until a few years ago, when tests were made by the Department of Agriculture of the University of Nebraska. These showed, among other things, that of corn, which, if burned, will yield from 22,512,000 B. T. U. to 45,024,000 B. T. U., not counting the heat that could be obtained from the stalk. Since a ton of good coal will give up from about 20,000,000 to 26,000,000 B. T. U., an acre of ground is each year capable of producing fuel which is equal to from 0.87 or 1.28 to 1.74 or 2.56 tons of coal. The stalk will probably increase this amount by one-fourth or one-third.

The experience gained from boiler tests with corn fuel made it appear doubtful whether corn would be a practicable fuel for the generation of power, unless it were burned in some special furnace that would insure the perfect combustion of the volatile matter which forms so large a percentage of the whole corn, and which is driven off at a comparatively low heat. Some form of automatic stoker would also be desirable, since the corn burns rapidly and must be frequently fired, making the work of the fireman very arduous, and at the same time tending to cause incomplete combustion by the excess of cold air entering through the fire door. Undoubtedly corn may, at times, be a cheap and economical fuel for domestic use. It is cleaner and more easily handled than coal, and contains but a very small amount of ash. It burns rapidly with an intense heat, and this is apt to be destructive to the cast iron linings of the stove. Here, again, therefore, some special form of fire-box, that will not be injured by the heat, and that will utilize as much of the heat as possible, should be used. —*Cassier's Magazine.*

## IMPORTANT COURT DECISION.

### DECISIONS OF THE U. S. COURTS.

#### Supreme Court of the District of Columbia.

UNITED STATES, *ex rel.* STEINMETZ,  
v. ALLEN, COMMISSIONER OF PATENTS.  
*Decided December 2, 1902.*

#### 1. MANDAMUS—REQUIREMENT FOR DIVISION—RIGHT OF APPEAL.

Where the Commissioner of Patents refuses to direct the Primary Examiner to forward to the Examiners-in-Chief an appeal from the Primary Examiner's action in requiring the applicant to divide his application, *Held* that his action will not be interfered with by mandamus, since the applicant has no right of appeal.

#### 2. RIGHT OF APPEAL—REQUIREMENT FOR DIVISION—REJECTION OF CLAIMS UPON THEIR MERITS.

Where the claims of an application for patent have not been acted upon as to their merits, but the applicant has been required to present them in two applications instead of one, *Held* that the claims have not been rejected within the meaning of the law and the rules, and that the applicant is not entitled to appeal to the Examiners-in-Chief.

#### 3. SAME—REJECTION OF CLAIMS—QUESTION OF PATENTABILITY.

The statute authorizing an appeal when claims have been twice rejected means that the claims must have been considered on their merits and found to be not patentable.

#### 4. SAME—INTERLOCUTORY MATTERS—OF PROCEDURE.

Where the patentability of the claims is not in question, but merely the manner of their presentation to the Patent Office, *Held* that the action of the Office is interlocutory and deprives the applicant of no substantial right which would entitle him to appeal.

#### 5. DIVISION—MATTER OF PROCEDURE—AUTHORITY OF COMMISSIONER.

The Commissioner of Patents is empowered by law to establish rules to regulate the procedure and practice in his Office, and the requirement that certain claims be presented in two applications instead of one comes within this authority.

#### 6. MANDAMUS—DIVISION OF APPLICATION—DISCRETION OF COMMISSIONER.

The requirement for division of an application is interlocutory and cannot be remedied by mandamus, since the question is peculiarly within the jurisdiction of the Commissioner of Patents and requires judgment on his part to decide.

# P A T E N T S

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-TWO YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

### INVENTIVE AGE

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

**E. G. SIGGERS,** 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Peter G. Minier, Inventor, Greenwood, Pa.; Ivor R. Titus, assignee, Huntington, W. Va. Car Door Hanger.—In this structure, the hanger is made of two sections, the upper one of which carries the usual wheel or roller running on a track, the lower being attached to the car door which is a sliding one. The adjacent ends of the sections are provided with transversely disposed enlargements having aligned slots. The sections are connected by a pin which passes through the slots and is loosely movable from end to end therein. By this arrangement, the sections are freely movable with relation to each other, and without undue friction. The door can therefore be readily moved inwardly or drawn outwardly because of the pin and slot connection. The door is moved outward in opening and pushed inward when closing, the roller maintaining its position on the track and permitting the door to be slid along as usual.

Harry H. Wilson, Lock Haven, Pa. Buckle.—This invention relates to a very efficient suspender buckle constructed entirely of wire and so arranged that very little metal is exposed. A base frame is employed having an enlarged rectangular portion, from which projects a contracted neck. The neck carries at its free end outwardly extending arms which are connected by a cross bar located over the base. Upon this bar is pivoted the tongue, which is also formed of wire, looped and twisted about the cross bar, the ends of the wire constituting engaging teeth. The base frame is housed or encased within a loop of the suspender webbing, and the tongue is arranged to clamp against said webbing without perforating or otherwise injuring the same.

William B. Rohmer, Bay St. Louis, Miss. Three patents. The first patent relates to a novel fender for street cars, said fender being so arranged that under normal conditions it is raised sufficiently to avoid all contact with the roadway, but will automatically and instantly lower should it come into contact with a person upon the track, thereby insuring the picking up of such person and obviating any danger of his passing beneath the fender and consequently the wheels. There is provided a downwardly swinging catcher member, normally supported by a forwardly projecting upwardly swinging and rearwardly moving trip frame, that extends a slight distance in front of the catcher member. This frame is provided with inwardly extending lugs upon which the catcher member rests. As soon as the frame strikes an obstacle in the roadway, it moves rearwardly a slight distance with relation to the catcher member and the lugs thereupon disengage from said member. The parts thus become separated, and the catcher member falls while the trip frame is automatically elevated out of the way.

The second patent covers very important improvements in mail bag catching and delivering mechanism, the parts being so constructed that bags may be delivered to and from rapidly moving trains without injuring the contents thereof. The car device employed in this apparatus can be placed in any convenient position with relation to the door, and is provided with locking mechanism arranged to engage the bag received, and automatically released by the bag delivered. This locking mechanism positively secures the bag, so that it cannot fall from the train after it has been caught. The inven-

tion has been successfully tested and found to meet all the requirements.

Third patent. Combined Fertilizer Distributer and Seed Planter.—This machine is adapted to be connected with an ordinary farm wagon in which a supply of fertilizer may be conveniently carried. The invention is adapted to open a furrow, deposit fertilizer therein, cover the fertilizer and mark the ridge without disturbing the fertilizer. It also deposits and covers the seed. When the apparatus is connected to a wagon, requisite play between the apparatus and the wagon is permitted to compensate for inequalities in the ground over which the apparatus is drawn.

Frank E. Dopheide, Palmyra, Ill. Jar Closure.—The jar closure of this patent dispenses entirely with external fastening devices, and at the same time insures the air-tight closing of the jar. The locking mechanism for securing the closure plug or top of the jar to the body portion consists of an ingenious arrangement of a thin flat packing ring seated in an internal groove of the neck of the jar and engaging the closure plug or top. The jar may be easily and quickly opened, without liability of cracking or chipping the glass, by simply inserting an instrument under a flange of the closure plug or top and prying the same out of the neck of the jar.

Merton R. Skinner, Le Roy, New York. Window Screen. In the present invention the screens are housed in casings provided at the top and bottom of the window when the sashes are closed, and simple and efficient locking devices are provided for detachably connecting the screens with each sash to enable the former to be used in summer and to be stored or housed in winter. The screens when detached are always at hand and may be instantly arranged for use. The inventor has also provided means for adjustably connecting the sashes, to overcome the combined action of the sash weights and the spring roller, which is attached to the upper screen and which may or may not be used in connection with the lower screen. When the screens are in use, they are operated automatically by the sashes and cover the openings between the same and the top and bottom of the window.

Harry L. Beach, Coshocton, Ohio. Advertising Device.—The Meek and Beach Company of Coshocton, Ohio, have obtained control of this valuable patent. The advertising device consists of a revolving sign, which may be of any size or shape, and when it is rotated every portion of it will be freely exposed to view. The supporting means for hanging the sign permit the same to rotate under the influence of the wind, no other motive power being required for operating the advertising device. The extreme simplicity of the invention is its strongest claim for popular approval.

David E. White, Winchester, Kans. Three patents have recently been issued to Mr. White. Two of these patents relate to harness buckles, and provide shields by which the tongue of a buckle is effectually housed or covered to prevent other parts of harness from catching on the buckle, and to also prevent the tail of the horse from being caught by the buckle tongue. The shields, which present an ornamental appearance, may be constructed either of leather or metal or any other material, and do not necessitate any alteration in the construction of a buckle, and may be transferred from one buckle to another. The shields are adapted to be readily manipulated to cover or expose the buckles.

The third patent relates to a cutting apparatus for mowing machines, and it involves a novel and advantageous arrangement of the blades on the cutter bar, whereby the bar is

strengthened and the blades brace and support each other, and at the same time present smooth upper faces to enable the cutting apparatus to reciprocate without friction. The blades are provided with laterally projecting ears, which are secured both to the cutter bar and to the adjacent blades to form a construction of great strength and durability.

Edward M. Hand, Orient, South Dakota. Wire Stretcher.—Considerable difficulty is experienced in stretching wire for the construction of fences: especially babred wire, which is dangerous to handle when placed under tension. Mr. Hand has invented a wire stretcher adapted to be readily attached to a fence post or other support and capable of operating on barbed or other wire, and of enabling the same to be gradually placed under tension by a step-by-step stretching operation, so that there will be no liability of subjecting a fence wire suddenly to an excessive strain. This improved wire stretcher is also adapted to hold a stretched wire in convenient position adjacent to a post, for stapling or otherwise securing the wire to the latter.

David E. Fleming, Hillsdale, Mich. Adjustable Window Screen.—The Fleming Window Screen Company of Hillsdale, Michigan, have purchased the entire interest in this patent, wherein adjustable screen sections are slidably connected in a simple and durable manner. The sections will not bind or accidentally separate while adjusting the screen to place it in or remove it from a window, and by an ingenious interlocking connection, the screen is entirely closed at all points in any of its adjustments to prevent insects from entering at the edges of the sections.

William G. Hall, Grafton, West Virginia. Plow Attachment.—The present invention consists of a cutting apparatus adapted to be readily mounted on a plow beam in advance of the plow to facilitate plowing through green foliage, such as grass, corn, cotton stalks and the like. It is adapted to cut such vegetation immediately in front of the plow to prevent the latter from becoming clogged, and it enables such vegetation to be conveniently turned over into the ground to rot and thereby fertilize the soil. A ground wheel operates the cutting apparatus and supports the front portion of the plow beam.

George M. Brous, Houlton, Oregon. Starting and Stopping Mechanism. An efficient device has been provided by Mr. Brous for controlling the drum of a winding apparatus, whereby the drum is moved into and out of engagement with the driving element. It insures a positive and effective interlocking engagement between the drum and the driving member, and also enables the former to be quickly engaged with and disengaged from the latter. The mechanism may be conveniently coupled to any ordinary engine, as for instance, the usual type of donkey engine commonly employed in connection with hoisting apparatus, and fluid pressure is utilized for shifting the drum.

Ralph R. Spears, Wheeling, West Virginia. Two patents. Plate Handling Machine and Automatic Register.—The plate handling machine is an automatic device for transferring a metal plate from the coating or plating bath to the bran-box. Heretofore the transference of the plate has been accomplished manually by a skilled operator known as a catcher. This machine is designed to take the place of the catcher, and is so constructed that the mechanical manipulation of the plate will be identical with the manipulation thereof by a skilled operator. The machine comprises a suitable support rotatably mounted, and supporting for movement there-

with, a series of plate carriers in the form of radially-extending arms each provided with a gripper. These arms are automatically carried down to engage the plate, and after being lifted to raise the plate out of the bath, are shifted through the movement of the support to present the plate over the bran-box where the plate is released. During the transference of one plate, another carrier engages a second plate preparatory to its transfer by a succeeding movement of the support. The machine is covered by a broad patent, and constitutes a distinct and undoubtedly valuable advance in the art.

The other patent is for an automatic apparatus for registering the number of loaded vehicles passing a given point, for instance, the number of loaded wheelbarrows employed for transferring bricks in a brickyard. The registering apparatus is located at any convenient point, and an actuator therefor projects above the surface of a gangplank so as to be depressed when the wheel of a loaded barrow passes over the same. The actuator is so adjusted that the register will indicate only when the barrow is loaded with a given number of bricks, and the registering mechanism is so constructed that the loads will be automatically counted and the total registered, so that the total number of bricks transferred may be quickly ascertained. Obviously this device is susceptible of a wide variety of uses.

Dr. J. C. Osborne, Lawndale, North Carolina. Artificial Tooth Crown.—This patent is of unusual interest to the dental world. The invention for which protection has been secured, is an artificial tooth crown having a novel post, by means of which the crown may be mounted upon and rigidly secured to a natural root quickly and with slight inconvenience to the patient. The crown post is constructed with special reference to the resistance of strains exerted both laterally and longitudinally thereon, and is designed to be fitted to the crown with its greatest diameters extending from mesial to distal and from palatal to labial, so as to present the greatest resistance in those directions from which it is naturally subjected to the greatest strain. The post is first secured in the root, after which the crown is placed upon its upper end. The crown is provided with an opening through which suitable filling is introduced and extended under a head at the upper end of the post. This filling serves to rigidly attach the crown in place.

Wilson E. Symons, Cleburne, Texas. Boltless Cast Steel Car Truck.—Mr. Symons has recently secured a patent for a boltless cast steel car truck of the general character shown in his former patent No. 649,183, dated May 8, 1900. These cast-steel trucks combine in a remarkable degree strength, durability, simplicity of construction and lightness in weight. The latest development resides in constructing the truck of but three parts, the two side frames and the transom, interlocked and keyed together to provide a substantial connection without the use of bolts, and each cast in a single piece. A connection of novel character is provided between the transom and side frames to reduce the machining or fitting to a minimum. One of the principal features of this latest invention is a novel construction which eliminates the rigidity of the transom characteristic of this class of truck, so that the weakening of the metal at the inner ends of the spring seats, ordinarily due to the crystallization of the metal under the torsional strain communicated to the transom from the side members, is avoided. In addition to these features of novelty, the patent recites many others which are of material advantage, but are too numerous to mention.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 697,625, dated April 15, 1902. A device for lifting pipes or rods from wells. May also be used to lower pipes into wells. For particulars address, Anton Hogenson, Calmar, Iowa. (apr)

**FOR SALE**—Patent No. 713,698. Automatic elevator or hoist, designed for elevating or conveying coarse material with wire cable instead of belt. Manufacturers of mining and milling machinery should investigate. Address: J. Sewell, 1100 East 5th Street, Anaconda, Montana. (apr)

**FOR SALE**—Patent No. 688,148. The up-to-date fire place. For neatness, simplicity, durability, and economy, I claim it cannot be surpassed. For sale or lease on royalty. For particulars address: L. B. Arnold, Hanly, Ky. (apr)

**FOR SALE**—Patent 714,527, sale or on royalty. November 25, 1902. Superior merit in fertilizer distributors. No clogging or slipping. Perfectly even distribution without the use of safety-board. Address Ernest C. Smith, Hinckley, Ill. (apr)

**FOR SALE OR EXCHANGE FOR LAND**—Patent Farm Gate No. 610,422 Issued Sept., 6, 1898. State rights for sale, or will place on royalty. Prices low. Address L. C. Tyler, R. D. No. 1, Alexandria, Ohio. (apr)

#### ANTI-NICOTINE PIPE.

A Great Bonanza.



Patented November 11, 1902. Patent for sale. Apply to Rickert & Williams, P. O. Box 257, South Milwaukee, Wis.

**FOR SALE**—Patent No. 716,510. A new and useful lock designed for mail bags, trunks and chests. Price reasonable. Address Isaiah Wolf, Midway, W. Va. (apr)

**FOR SALE**—Patent No. 671,498, dated April 9, 1901. Saw Handle Attachment, for blowing sawdust away during operation. Will sell outright or on royalty. Address Emil A. Michalscheck, No. 1610 Crockett Street, Houston, Texas. (apr)

**FOR SALE**—Patent No. 715,495, dated December 9, 1902. Mail Bag Fastener. For holding the rope of mail bags. Patented in the United States and Canada. Address Merrill & Son, Nora Springs, Iowa. (apr)

**FOR SALE**—Patent No. 712,858. An improved adjustable roller curtain bracket. Something new in curtain fixtures. Can be adjusted to hold varying widths of rollers. Can be set to desired place without trouble or worry. Address Joseph F. Seibert, 1124 Church Street, Reading, Pa. (apr)

**FOR SALE**—Patent No. 708,272. Spring Vehicle Brake. Address James A. Tautphaeus, Sappington, Mo. (mch)

Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING CO., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

## "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O. ....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

**FOR SALE**: Patent No. 528,571. Automatic shutter bowing hinge. Holds shutter in any position desired without use of ribbon. Has other improvements. Will sell county, state or entire right at low rate. Address Harry Peoples, Box 92, Mount Joy, Pa. (apr)

**FOR SALE**: Patent No. 715,636. Pencil or pen holder made out of one piece of wire. Fastens to top vest pocket. Sells on sight. Address J. R. Booth, Sault Ste. Marie, Ontario, Canada. (apr)

**FOR SALE**—Patent No. 712,720, November 4, 1902. Air Bed, Cushion, etc. Sanitary, economical and convenient. Simple, cheap, yet strong and durable. Especially convenient for soldiers, hospitals, etc. Will sell outright. Address Fannie L. Richardson, Corinth, Miss. (mch)

**FOR SALE OR EXCHANGE**—Clipper Curry-comb. Will clean an animal better than any other. Patented in United States October 14, 1902, No. 711,423. Canada, December 9, 1902. Price \$20,000 for both countries. Address Frank L. Greene & Bro., Wellsboro, Pa. (mch)

**FOR SALE**—Combination tie plate and rail bracer. Great tie saver. Should be used on all curves. For particulars address A. J. Flynn, 722 E. 137th St, New York, N. Y. (mch)

**FOR SALE**—Patent No. 711,799. Four Horse Draft Ewever. Especially designed for 16-inch sulky plows. Works perfectly in every way. Address Henry A. TePoel, Prague, Nebraska. (feb)

#### WANTED.

**WANTED**—A fully equipped Machine Tool Company wishes to add to their line of goods. Also solicit metal pattern work, perfection of models, jobbing, &c. Address C. N. Grace, 341 W. 20th St., Erie, Pa. (mch)

**WANTED**—Partner wanted with capital to manufacture Nut Wrench patented December 31, 1901, patent No. 690,187. Best wrench for quick work. Address Jesse L. Robison, Cross Fork, Pa. (apr)

## CAPITAL

Can be secured for the right kind of inventions. Perhaps we can help you.

W. C. & F. D. BURGESS,  
NEWARK, NEW YORK.

YOU SHOULD SUBSCRIBE FOR THE  
ARMY AND NAVY  
- - - MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. The ARMY AND NAVY MAGAZINE, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00

—WE SELL THE BEST—

## Machine Tools

FOR THE AMATEUR

AND FOR THE BIG SHOP.

—Prices always reasonable—

HILL, CLARKE & CO.,

CHICAGO, BOSTON, NEW YORK.



The Manhattan  
Typewriter,  
Guaranteed to be of the  
Highest Grade.

NOT IN THE TRUST.  
PRICE \$50.

JOHN C. PARKER,  
619 Seventh St. N.W., Washington, D. C.

Now is the time to subscribe for

### Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,  
Send for sample copies. ALLENTOWN, PA.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

FRED. B. NICHOLS & CO.,

913 Est., N. W.,  
Wholesale Stationers, Washington, D. C.

### Thousands

of inventions in the field of Railway and Engineering are being patented every year.

### The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America. For rates, address—

The Railway and Engineering Review,  
1305 Manhattan Building, Chicago.

## A NEW BOOK FOR INVENTORS. Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— The Inventive Age Pub. Co.,

918 F St., N. W. WASHINGTON, D. C.

E. C. WILEY,  
Mechanical - - -  
- - - Engineer,  
Office 811-1-2 Main Street,  
Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.

## RIPANS



The simplest remedy for indigestion, constipation, biliousness and the many ailments arising from a disordered stomach, liver or bowels is Ripans Tablets. They have accomplished wonders, and their timely aid removes the necessity of calling a physician for many little ills that beset mankind. They go straight to the seat of the trouble, relieve the distress, cleanse and cure the affected parts, and give the system a general toning up. The Five Cent packet is enough for an ordinary occasion. The family bottle, 60 cents, contains a supply for a year. All druggists sell them.

## THE AMERICAN HAY, FLOUR, AND FEED JOURNAL.

The Recognized Organ of the Dealers in Hay, Flour and Feed. A Magazine that brings the Miller and Shipper in touch with the Dealer. It shows the Dealer where to buy his Goods.

PUBLISHED MONTHLY.

Subscription price, 50 cents a year in advance. Sample copy sent on application.

SHIPPERS & RECEIVERS PUBLISHING COMPANY.  
Produce Exchange. New York City.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion: 7 words to the line. No advertisement less than 25 cents.

Address all communications to

THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, FEBRUARY, 1903.

### Australian Federal Patent Bill.

There has been considerable talk in recent years of having the Australian states federated. At present, it takes six patents to include the whole of Australia. It is contemplated that one patent should cover the six states, and it seems likely that within a couple of years, this desirable result will be attained. It is also intended to modify the trademark registration laws, so that one certificate of registration will include the entire commonwealth. It is not generally known that five-eighths of the whole population of the Commonwealth reside in the states of Victoria and New South Wales. Conversion of state rights to Commonwealth privileges is likely to be provided in the Federal Act.

We have received a draft of a bill which the Australasian Institute of Patent Agents hopes will be enacted into law. Among the provisions is a requirement that the Comptroller, who occupies the same position in the granting of patents as the Commissioner of Patents in this country, should be given power to require the Examiner to report, in the case of a complete specification only, if the invention has been previously patented in the Commonwealth of Australia, or in any of the states of Australia prior to the date of the Commonwealth Patent Act coming into force.

Many of the provisions of the new law are patterned very closely after the amended English Patent Law referred to recently in the AGE. In the matter of registering trade-marks, it is proposed that the bill introduced into the British Parliament, and prepared by the London Chamber of Commerce, be adopted *in toto* in Australia.

It is believed that the change in the Australian patent and trademark laws will result in a large increase of applications, for the great expense of obtaining Australian patent protection in the past as well as registering trade-marks, due to the necessity of making six applications to cover the whole Commonwealth, has been the only thing that has stood in the way.

### More Examiners Wanted.

In the May issue of the AGE, we referred to the fact that a certain increase in the Patent Office force was obtained by Commissioner Allen from Congress last spring. The increase became effective on the first of July, 1902, since which time, we are advised, the Patent Office has been endeavoring to fill the positions, but a sufficient number of competent men have not yet applied and there are a number of places still vacant. Not that there has been any dearth of applicants: on the contrary, their number has been legion. There has, however, been a scarcity of desirable applicants. Men who are qualified to fill the position of examiner in the Patent Office can frequently make as much, if not more, outside, and largely for this reason, the Patent Office has not been able to fill the vacancies that now exist in the examining corps. It is an excellent opportunity for young members of the engineering profession. In order to secure the appointment as assistant examiner, it is necessary to pass a Civil Service examination, but this should not be a difficult matter for graduates of any of the technical schools.

The salary of a fourth assistant examiner is \$1200 a year, and by successive promotions to fourteen, sixteen, eighteen hundred dollars, and twenty-five hundred dollars, the position of principal examiner is reached, which is one of considerable responsibility and authority, and is desirable from many points of view.

Usually, the young men who come to Washington to accept employment as Patent Office examiner, take additional courses of law, chemistry, or higher mathematics in the various schools of Washington, and thus perfect themselves so that they may be better qualified to occupy the higher places open to them.

Promotion in the Patent Office ranks is quite rapid, much more so than in any other government department, this being due to the fact that many of the principal and assistant examiners resign every year to accept positions in private offices, or go in business for themselves as patent solicitors. The training that a young man receives in the Patent Office is excellent, and fits him for higher duties both inside and outside the Patent Office. In numerous instances men have risen from the ranks to become commissioner and assistant commissioner of patents.

The work at the Patent Office is varied in character, and considerable of it is purely scientific. There are as many different lines of work in the Patent Office as there are practical applications in arts, sciences and industries, so that a young man is able to work along that line for which he has a particular bent.

The question of remuneration should be a minor one with the applicant for the position. He should look forward and aim for a higher position. This, however, can only be secured by continuing the training which was started in the schools he has attended. The official hours of work are such that outside work can be carried on effectively; thirty days annual leave is allowed, as well as thirty days sick leave with pay.

It is hoped, for the sake of the Patent Office, as well as for the youth of the country, that there may be a rush of bright young men to take part in the next Civil Service examination

held for the position of assistant examiner in the Patent Office.

Applications should be made direct to the Civil Service Commission, Washington, D. C., from which full details as to the requirements, etc., may be learned.

### New Legislation Needed.

Another attempt to mandamus the Commissioner of Patents has failed before the courts. This time it was on the question of division. It the case referred to, the applicant had been required to cancel certain claims from his application, on the ground that they were not properly related to certain other claims, so as to entitle them to be covered by a single patent. Ordinarily, an applicant, under such circumstances, would have taken an appeal from the decision of the Examiner to the Commissioner of Patents, and had the Commissioner review the action of the Examiner; but evidently the attorney for the applicant was desirous of having the court pass on the validity of those rules of the Patent Office, which compel an applicant to cancel claims from his application on a requirement of division. Instead of proceeding in the ordinary way, the applicant took an appeal to the Board of Examiners-in-Chief, but that tribunal refused to entertain the appeal because the Primary Examiner had not forwarded the papers in the case. Upon appeal to the Commissioner, he held that the requirement of division did not involve the merits of the claims, and that in such a matter no appeal to the Board of Examiners-in-Chief would lie. Whereupon, the applicant filed in the Supreme Court of the District of Columbia a petition for a writ of mandamus against the Commissioner of Patents, to require him to direct the Primary Examiner to forward to the Board of Examiners-in-Chief, the appeal which the applicant had taken from the action of the Examiner in refusing to allow certain claims to be embraced in the application.

It was urged on behalf of the applicant, that the several claims of the application constituted a single invention, and that it was an error on the part of the Patent Office Examiner to require that any one of said claims should be cancelled. The court said:

"Although the compulsory division of claims pertaining to a single invention may be a serious matter for the inventor, it is still interlocutory, and it does not seem to be one that can be remedied by a proceeding in mandamus, for it is a technical question, peculiarly within the jurisdiction of the Commissioner of Patents, and requires judgement on his part to decide."

Without, therefore, passing on the merits of the question, the court ruled that the statute authorizing appeals in the Patent Office, when claims have been *twice* rejected, means that the claims must have been considered on their merits and found to be not patentable, and denied that the right of mandamus could lie against the Commissioner under the circumstances.

While it is of course very unfortunate that an applicant has no right of appeal on a question of division, and that this is considered as a purely formal matter, whereas, in many cases, it is vital to the applicant that it should be settled right, yet it cannot be denied that the decision of the court was in strict accordance with the general principles governing the grant of writs of mandamus. It is hoped,

however, that some way may be found in the future by which the right of an applicant to an appeal on the question of division may be passed on, and the question of division rescued from its present unsettled state and determined fully and finally by a court having competent jurisdiction.

### NEW BOOKS.

#### DIES:

Their Construction and use for the Modern Working of Sheet Metals.

By JOSEPH V. WOODWORTH

Price \$3.00

This work is aimed to be a complete treatise upon the designing, constructing, and use of tools, fixtures and devices, together with the manner in which they should be used in the power press, for the cheap and rapid production of the great variety of sheet-metal articles now in use. It is designed as a guide to the production of sheet-metal parts at the minimum of cost with the maximum of output. The hardening and tempering of press tools and the classes of work which may be produced to the best advantage by the use of dies in the power press, are fully treated.

The engravings comprehend dies, press fixtures and sheet metal working devices, from the simplest to the most intricate, and the descriptions, it is believed, are so clear and practical that all metal-working mechanics will be able to understand how to design, construct and use them. Many of the dies and press fixtures treated were either constructed by the author, or under his supervision. Others were built by skillful mechanics and are in use in large sheet-metal establishments and machine shops.

The book was written by a skilled and successful workman, and is one that die-makers, machinists, tool-makers and other metal workers cannot afford to be without.

Contains 384 pages, 505 illustrations. In size 9x6 inches. Well bound in cloth.

Norman W. Henley & Co., Publishers, 132 Nassau Street, New York.

#### Hardening, Tempering, Annealing and Forging of Steel.

By JOSEPH V. WOODWORTH

Price \$2.50

This is a new work treating clearly and concisely on modern processes for heating, annealing, forging, welding, hardening and tempering of steel. It is a book of exceptional value to metal-working mechanics, giving directions for the successful hardening and tempering of all steel tools, including milling cutters, taps, thread dies, reamers (both solid and shell), hollow mills, punches and dies, the various metal-working tools, shear blades, saws, fine cutlery, metal-working and metal-cutting tools, and other implements of steel both large and small. Simple and satisfactory hardening and tempering processes are described.

The uses to which the leading brands of steel may be adapted are discussed and their treatment for working under different conditions explained; also particular methods for the hardening and tempering of special brands. There are embodied various "kinks" and practical points which contribute to make the volume a useful textbook on the modern treatment of steel.

A chapter devoted to the different processes for case-hardening is included, and reference is made to the adoption of machinery steel for tools. The illustrations will help the mechanic in showing him modern devices, machines and furnaces.

Contains 384 pages, 505 illustrations. In size 9x6 inches. Well bound in cloth.

Norman W. Henley & Co., Publishers, 132 Nassau St., New York.



## SCIENTIFIC

## PROGRESS.

## Cleaning Sheet Metal.

A machine for cleaning sheet metal has been patented by Mr. Charles G. Wemlinger, of Chicago, Ill. He employs a casing provided with a hinged cover for its top and a sliding drawer for its bottom. Within this casing are journaled three pairs of feed rollers arranged in alinement, the upper roller of each pair being adjustable toward and from the lower roller. A feed slot is formed in the casing adjacent to the first pair of rollers and in line with the space between them, while a discharge slot is arranged in rear of the last rollers. Between each pair of rollers is journaled a rotary cleaning brush constructed of sections, and having radially disposed bristles that are arranged to engage the upper face of a sheet passed between the rollers. The brushes and rollers are driven by suitable gearing arranged exteriorly of the casing. The brushes are vertically adjustable, so that as the bristles become shorter from wear, said brushes may be moved bodily towards the sheet.

## Trolley Pole.

A new trolley pole that is claimed to have distinct advantages over those now in general use has been patented by Mr. Theodore C. Buder, of St. Louis, Mo. On the upper end of the pole is journaled a pair of spaced triangular plates that are freely revoluble. Journaled to and between these plates are three trolley wheels so arranged that two will, under normal conditions, bear against the wire, one being disposed directly behind the other. As a result of this arrangement, the danger of the trolley jumping the wire is to a great extent obviated, and a continuous contact is assured. This will be apparent when it is considered in connection with small obstructions, such as kinks in the wire or the like. These obstacles as is well known will cause a single wheel to bound out of contact for an instant even if it does not entirely become disengaged. With the improved structure, however, a continuous contact is secured; for should the first wheel become dislodged, the rearmost which has not yet met the obstruction will remain in contact and by the time the latter wheel reaches it, the foremost is back in position. In case a larger obstruction is met with, the head as a whole simply revolves over it, thus bringing the inoperative wheel into position as the foremost one.

## De-Coupling Attachment.

A Canadian, Mr. Lewis Voivin, residing at St. Saubeur, Quebec, has invented and patented in this country a decoupling attachment which while holding a driven pulley and shaft against slipping under ordinary conditions will release the pulley in case of abnormal resistance due to the catching of obstacles in the machinery driven. To this end, the shaft is provided with a recess or socket, in which is placed a hardened steel block having a seat in its outer face. The pulley is loosely journaled on the shaft and

is provided with a sliding pin, the inner end of which is sharpened and engaged in the seat, thus holding the shaft and pulley together under normal conditions. The pin is held in place by a spring, the tension of which can be varied to suit the different requirements of work. As long as the machinery is operating properly, the pin will be engaged in the seat, but should abnormal strain or resistance be imparted from any cause, instead of the gearing being stripped as usual, the pin will disengage from the seat, so that the pulley may freely revolve while the shaft will be in a state of rest. After the pin is raised by its disengagement from the seat, it is locked in its elevated position by a spring-pressed catch engaging the same, so that it will not again become relocked to the shaft.

## A New Grinding Wheel.

A grinding wheel that has lately been patented by Mr. Jas. W. Forster of Chicago, Ill., involves a novel combination of elements. The inventor first makes a pulp of wood fiber, cloth, paper or shoddy, or a combination of all these elements, which is brought to the desired consistency by being intermixed with a sufficient amount of liquid to produce a pasty mass. With this mass of pulp is mixed a desired grade of grinding material, such as fine emery or corundum. The entire mass is then agitated so as to make a homogeneous mixture, which is then taken while in a plastic condition, placed in a mold, compressed and then baked or dried. A grinding wheel as thus produced is not a mere mass of cutting material, the particles of which are glued together. Instead, the hardened pulp forms a fibrous body, into which the particles of cutting material are set, and as this body of pulp contains no glue, it will not fill the spaces between the cutting edges, while it does serve to hold said edges constantly exposed as the wheel is gradually worn away by use, thus always presenting a clean-cut cutting surface. Mr. Forster claims that grinding wheels constructed in accordance with his invention have many advantages over those now in general use. Among these may be mentioned the tenacity with which the binding material holds the grinding material in position for use, and another feature resides in the fact that it does not chip off as readily, so that it may be handled and transported without as much danger of injury or destruction.

## New Composition of Metal.

In the use of iron there are often cases where the rigidity and hardness of cast-iron or steel is needed without the tensile strength of wrought iron or steel, and yet because the cast metal is brittle, it cannot be used for fear of breaking under accidental jars and sudden strains. On the other hand, to use enough of the wrought metal to obtain the desired rigidity involves too great expense and requires too great a bulk of metal. The essential difference between the hard cast or high-carbon metal and the soft wrought or low carbon metal, is not so much chemical as structural. The former is crystalline, having no fiber. The latter is laminated in structure with a long fiber or "grain" in the mass. The best puddled iron, even when it has more carbon than certain cast-steels, is yet tougher and more malleable than the latter. It is

therefore plain that the toughness is due to the internal structure, the fibrous weaving that is attained by the mechanical operation of puddling and rolling. The object of a recent invention, patented by Mr. William Kent of Covington, Ky., is to produce this kind of structure in a composite metal by interspersing filaments of wrought iron or steel in a mass of cast iron or steel in the act of casting, and weave them in the mass by rolling rather than by mechanically mixing or stirring in the puddle while the metal is liquid.

Certain irons, like "Bessemer cast", for example, while they may be rolled when hot, become brittle when cold. Mr. Kent prefers to use this class of cast metal, and gives it tensile strength and overcomes its brittleness by incorporating in its mass various fibers of wrought metal welded in with it.

The cold wrought iron or steel is arranged in an ingot-mold, so that the size of the pieces varies inversely with the distance of the piece from zone of greatest heat—that is, the center of the mold. Then molten high-carbon iron or steel at a sufficient temperature to fuse the wrought metal is poured into the mold, when the heat imparted to it brings it to the welding state and the two become thoroughly welded together. The oxid in the fusing and in the subsequent rolling is displaced, and allows full welding while itself adding strength to the composite metal by toughening the grain. The ingot may then be rolled into the desired form, and the metal will have in a large measure the qualities of both cast and wrought metal, these qualities being improved by rolling and working, which more intimately incorporates the two metals and further intermixes the oxid slag.

## Electric Candy Making Machine.

A unique invention in the electrical art is a candy-making machine that has recently been patented by Messrs. William J. Morrison and John C. Wharton, both of Nashville, Tenn. A rotatable vessel is employed comprising a lower pan-shaped section and an upper cover having a central opening, the two sections being secured together by means of vertical tie bolts, so that their edges are spaced a slight distance apart or have apertures. Within the receptacle thus formed, and in line with the space or peripheral aperture, is a corrugated annulus or band of metal having such electrical resistance as to become heated by the passage of a current of electricity through it, the ends of this band being spaced apart. Instead of sheet metal, a coiled wire or other suitable resistance may be employed. The receptacle is supported in horizontal position upon an upright tubular insulator which is attached to a vertical shaft arranged to be driven by an electric or other motor. From the resistance band, wires lead to suitable sleeves arranged upon the insulator and having brushes bearing against them. In operation, granulated sugar is poured into the vessel through the central opening in the top, the motor which drives the machine is started, and the current it turned through the resistance coil or band. This band being heated to a sufficient degree, which is controlled by a rheostat, causes the sugar to melt and the centrifugal force due to the rotation of the vessel, expels the melted sugar through the peripheral aperture in the form of silk-like threads, or by regulating the heat and changing the form of heater and receptacle, a hard variety of stick-candy may be made. Since the molten sugar becomes more

fluid at a higher temperature, its tendency to form threads is lessened at the increased heat, and the molten sugar may be received into a receptacle placed very near to the rotating vessel, so as to confine the heat and receive the liquid sugar in its molten condition on the surface of a cylindrical or polygonal receptacle, which chills, forming "sticks" or bars of such shapes as the receptacle may be made to give it. The inventors also provide means for introducing grated fruits, etc. into the candy. They employ a circular grater that is arranged upon the cover member directly over the orifice through which the candy escapes. By holding the fruit against this grater, it will be shredded and the comminuted portions will be thrown off by centrifugal force into the candy.

## Coating Iron With Zinc.

Mr. Sherard Cowper-Coles, an electro-metallurgist, residing in London, England, has discovered a novel process of depositing metals on metallic surfaces, and he has obtained a patent in this country on the same, which has been purchased by the Sherardizing Syndicate, Limited, of Westminster, London, England. The invention relates to a process of depositing zinc or other metal on iron or steel, thus protecting the surface of the latter from the effects of oxidation or similar corrosive agencies. By this method the iron or steel acted on, has formed on it a thin homogeneous covering of zinc, rendering it non-corrodible. Hitherto the most successful results with regard to the deposition of zinc on iron or steel have been achieved either by dipping the metal to be coated in a bath of molten zinc, usually known as the "hot" galvanizing method, or depositing the zinc electrolytically, generally known as the "cold" galvanizing method. In the former case there are two principal disadvantages—namely, the difficulty of regulating the depth and even distribution of the deposit, and the deleterious effect of the heat of the bath on the metal being coated. In the case of the electrolytic process the deposition can be better regulated and the temper of the metal is unaffected, so that this latter process is undoubtedly well adapted for certain articles, such as tubes; but is not easily applicable to large masses of metal, such as castings, or to articles of intricate form. By the new process, the thickness and evenness of the deposit can be regulated, as desired, and any description or shape of iron or steel can be satisfactorily and economically dealt with.

The surfaces of the articles to be coated are first cleansed by any well-known process, such as pickling or by the sand-blast, and are then placed in a metal-receptacle of iron or steel, and covered with "zinc-dust." The air should be excluded as much as possible, and for this reason a closed receptacle is preferable. This receptacle or box is then submitted to the action of heat (about the dull-red heat of iron is sufficient) for half an hour to an hour, depending on the thickness of deposit required. This receptacle is then allowed to cool and the articles withdrawn, when they will be found to have deposited on their surfaces a smooth tough adherent coating of zinc.

The deposit on the iron or steel can be formed of more or less thickness, according to the length of time during which the zinc-dust is allowed to act on it. If the zinc deposit so formed be removed by any mechanical means, such as filing or chipping, the surface of the iron exposed is still unaffected by corrosion.



## THE UTILIZATION OF WASTES AND BY-PRODUCTS IN MANUFACTURES.

WITH SPECIAL REFERENCE TO THE DECADE OF 1890-1900.

By HENRY G. KITTREDGE, of the Census Bureau.

### PART VI.

#### WOOLEN INDUSTRY.

The woollen industry furnishes a number of materials formerly regarded as waste, that are now utilized in the industry itself and for pharmaceutical and other purposes. The principal articles of waste are rags and wool-grease. The former is reconverted into wood and used the same as the original raw material, while the latter is employed in other industries. The sheep obtains from the soil of the pastures upon which it feeds a considerable portion of potash, which, after circulating through the system of the animal, is excreted with other matter from the skin and becomes attached to the wool. This excretion is known by the French as "suint," and oftentimes constitutes, together with the dirt that is mixed with it, two-thirds of the weight of the fleece. Formerly the suint was allowed to go to waste when the wool was cleaned; and even now a large portion of it that is taken from the fleece is allowed to go to waste with the wash waters. There is a disposition at present, however, to recover the grease from the wash waters and use it for industrial purposes. At first, attention was directed to the saving of suint for the purpose of obtaining the potash and potash salts contained in it; and with this object a special industry was established in the wool districts of France and Belgium for converting it into commercial products, which were exhibited at the several industrial expositions in Europe, and especial mention was made of them at the Paris Exposition of 1867, many of them receiving silver medals.

The encrusting matters attached to wool, besides the dirt, consist of wool fat, which is soluble in ether, and wool perspiration, which is soluble in water. The wool fat and the wool perspiration are together embraced under the name of the "yolk" of the wool. The wool fat is a mixture of a solid alcoholic body, cholesterine, together with iso-cholesterine, and the compounds of these bodies with several of the fatty acids. These free higher alcohols are soluble in boiling ethyl-alcohol, while the compounds they form with the fatty acids are insoluble in alcohol but soluble in ether. Wool perspiration consists essentially of the potassium salts of oleic and stearic acids, and possibly other fixed fatty acids, also potassium salts of volatile acids, like acetic and valerianic, and small quantities of chlorides, phosphates. Thus it will be seen that the yolk of wool contains many elements of recognized value in arts and manufacturing.

When the potash salts are evaporated and ignited, they yield a product of potassium carbonate, and it is estimated that 2,200,000 pounds of this

product is saved from the wool wash waters of the mills and scouring establishments of France and Belgium. When the yolk is submitted to dry distillation it yields a residue containing carbonate of potash, nitrogenous carbon of great value for the manufacture of yellow prussiate of potash. According to M. Chandelon, 2,200 pounds of raw wool may furnish 300 quarts of yolk solution of 1.25 specific gravity, having a value of \$3.75, while the cost of extraction does not exceed 60 cents.

It is only within comparatively recent years that volatile solvents have been used for extracting the yolk from wool. By far the greater quantity of wool is still cleansed by the old process of scouring with alkalis and washing in a rapid current of water. The volatile-solvent process, however, is coming into use, though now confined chiefly to establishments where large quantities of wool are cleansed. The great cost of the plant for cleansing wool by this method confines it to large establishments. Various volatile solvents can be used, such as fusel oil, ether, petroleum, naphtha, and carbon disulphide. When these solvents are used they have to be followed by washing with water, as, while they dissolve fatty matters, they do not take up the oleates, etc., of the wool perspiration. The treatment of wool by these means is now confined to petroleum naphtha, and, as now conducted, according to the best methods in vogue, is found to be not only practicable but remunerative, both in the saving of a valuable product and in leaving the wool in an excellent condition for the various processes of manufacture.

In 1897 a bill was presented to the English Parliament, from the Bradford district, relating to the treatment and disposal of "suds" from the wool washbowls in combing sheds. At that time considerable interest was attached to a process which had been introduced at the works of Messrs. William Scaife & Co., wool combers, Laisterdyke. The process is described as exceedingly simple and apparently successful. The suds, after being run off from the washing bowl, are allowed to stand for about half an hour in a settling tank, to permit the sand and solid matter to fall to the bottom. The liquor is then pumped into a tank, very much like a washbowl, in the bottom of which is a system of pipes through which compressed air is forced. About one gallon of sulphuric acid is added to every 700 gallons of suds before the "blowing" begins. The violent aeration of the liquor which ensues quickly brings the grease to the surface in the form of a thick foam or froth, and a set of boards, carried on an endless chain, scrapes this off and carries it away over one

end of the tank. The blowing is continued as long as any froth arises, which is just as long as there is any grease left in the water. The foam, which contains only about 5 per cent of water, is treated just as the magma, obtained in the usual way by precipitation, is dealt with—by pressure in a steam press.

Within the past five or six years, several methods for cleansing wool, and for the recovery of the grease, etc., from the wash liquors, have been introduced into England and on the continent, that have attracted considerable attention and comment from scientific journals. At the works of Thomas Biggart, of Dalry, Ayrshire, the recovery of grease and potash from the wash liquor is effected in the following manner: The suds from the first scouring bowl, containing about nine-tenths of the grease and potash, after standing about twelve hours to insure deposition of the sand, are evaporated in a pan until the liquid attains a sirupy consistency. The resultant liquid is then cooled in shallow iron trays, and the grease which collects on top is removed at intervals. The semiliquid residue is then calcined in a brick oven and the heat produced from it is used to assist in the evaporation. A crude carbonate of potash is thus produced, which, after being completely carbonated, is boiled to dissolve out the potash salts. The solution is then concentrated to 100° Tw., the potassium sulphate and chloride crystallizing out on cooling. The potassium carbonate and grease obtained are sold.

In a recent type of machine—that of Emile Richard-Lagerie, of Roubaix, France—the wool is subjected successfully to the action of liquors of diminishing strength, the last being clear water. The liquors, after having passed through the wool, are pumped into tanks for redistribution until they attain a density of 1.07, when they are evaporated and the residues calcined for the manufacture of potassium carbonate. Each machine is capable of dealing with about eight tons of wool per 24 hours.

The grease is extracted from the suds at the works of Alf, Matte & Co., Roubaix, by a mechanical process of "battage." The suds are, by means of a rotary agitator, beaten into a froth, which carries the fatty matters to the surface. These are skimmed off into conduits by a mechanical scraper, and are forced by a steam extractor into a wooden tank in which they are heated to 60° C. and treated with sulphuric acid in the proportion of 1 pound to 100 gallons. The acid is then removed by washing and the grease is filter pressed.

In the establishment of Thomas Fox, Wellington, Somerset, the soapy liquors are led into 6 acidifying tanks and treated with sufficient acid to liberate the fatty acids. These on separating, together with the wool fat, are drained on sawdust filters. They are afterwards taken off and purified by distillation for conversion into soap again. The dilute acid from the acidifying tanks is pumped into intermediate storage tanks for further settlement, after which it flows into

the precipitation tanks and is treated with the general waste waters from the works, by aluminoferric, sulphate, and lime.

There has been a patent granted in England (No. 20433, October 29, 1895) for improvements relating to removing, recovering, or separating certain constituents from the suint and obtaining certain valuable products therefrom. The solvent employed in this process for treating the wool is a heavy petroleum oil (specific gravity, 0.837 to 0.878) at a temperature of 120° F. On cooling the resultant liquid to about 70° F., the cholesterol of the suint separates as a heavy deposit, while the glycerides remain in solution. This solution is found to be an efficient agent in scouring the wool, leaving it in a condition suitable for the subsequent carding, etc. The wool is treated with the petroleum oil in an ordinary wool-scouring bowl fitted with pressure rollers. One-half to one gallon of solvent is employed for each pound of wool. After about twenty minutes' action the greater part of the liquid is drawn off, and the operation is repeated if necessary. The wool is then treated with water or neutral soap, rinsed, pressed, and dried. After filtration the liquid is cooled, the deposit is removed, and the clear solution used again. This solution may also be employed as a lubricant or for use on leather, and since it contains no free fatty acids, it would seem to be better adapted for either purpose than the analogous mixture of degrease and petroleum oil.

Among the most valuable improvements in treating wool fat and producing products therefrom are those covered by a United States patent (No 539386) recently granted to William D. Hartshorne, of Methuen, Mass., and Emile Maertens, of Providence, R. I. By the methods employed by these inventors, 5 resultant products are obtained from wool fat. The object of the invention is to more thoroughly separate or divide wool fat into products possessing different properties and characteristics, so that the constituent parts of the wool fat, when obtained in a comparatively pure isolated state, are in the best form to be put to the various uses to which each is best adapted. This separation is considerably affected by temperature and by concentration of the solution from which and by which they are extracted. The fat products obtained are applicable to the following uses: (1) As a base for ointments and other pharmaceutical and toilet preparations on account of its penetrating, lubricating, and softening qualities. (2) As a leather and belt dressing, and, when freed from resinous matter, as a lubricant in conjunction with certain lubricating oils. (3) As a lubricant for wool and other animal fibers. This can be used to advantage to increase the specific gravity and viscosity of certain lubricating oils.

The inventors refer to wool fat as chemically a mixture or combination of cholesterin or its isomers or allied substances or alcohols with various fatty acids of resinous matters, and sometimes of such matters in a free state. The exact chemical relationship of these as they exist in the original wool fat on the sheep is, in the opinion of the inventors, very complex, and probably has never been accurately determined, and in the nature of the case may be indeterminable.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued December 30, 1902.

### MECHANICAL PATENTS.

(Continued from January Number.)

Ships at sea. Means for coaling..... A. C. Cunningham  
Shirring band. Skirt..... F. E. Bush  
Shirt..... B. Lichtig  
Shoe vamp stay..... J. H. Charnbury  
Shoemaker's jack..... I. Holzmark  
Signal gong. Electric..... H. C. Thomson  
Signaling system. Electrical..... A. C. & A. C. McKnight, Jr.  
Skirt drier..... E. P. McCloskey  
Slicer..... G. L. Leachman  
Sluice or runway..... G. Telford  
Snow plow..... J. W. Russell  
Soap cake..... N. J. Nilsson  
Socket..... N. M. Cox  
Socket member..... W. B. Murphy  
Sofa, couch, &c..... H. Heinemann  
Speed changing apparatus..... I. J. Foccart  
Speed mechanism..... E. Baseman  
Speeding device. Fluid pressure..... J. Wiechmann  
Sprayer. Liquid..... L. A. Aspinwall  
Spraying apparatus..... T. W. Lubbecke  
Sprinkler head..... J. K. S. Ray et al  
Stacker. Pneumatic..... E. P. Alsted  
Stacker. Pneumatic..... A. A. Stelling  
Stairs. Means for repairing wooden..... F. Jensen  
Stall. Cow..... W. A. Snow  
Stamp affixing machine..... J. T. Welke  
Stamp. Time..... F. W. Hubbard  
Staple..... H. D. Rapson  
Starch. Making..... H. A. Frisch  
Starting gate..... P. McGinnis  
Steam generator..... R. M. Oates  
Steam heating apparatus..... A. P. Broomell  
Steam trap. Expansion..... C. Fletcher  
Steaming cabinet..... G. J. Burns  
Steel seat. Pressed..... W. S. Judd  
Sterilizing apparatus..... R. R. Pease et al  
Stiffener. Garment..... H. Feder  
Stone. Apparatus for manufacturing artificial..... W. Bugler  
Storage battery..... C. H. Clare  
Stove..... O. J. Holmes et al  
Stove base. Skirted..... C. H. Bailey  
Stove. Heating..... J. E. T. Dickinson  
Stove. Portable..... C. W. Mettler et al  
Stove. Smoke consuming heating..... M. McInnemy  
Stove. Ventilating..... F. R. Shafer  
Stovepipe thimble..... G. W. Stilson  
Street sweeper..... W. Hight  
Striking bag disk..... R. Reach  
Sugar. Converting cellulose into..... A. Classen  
Sugar loaves in vacuum. Drying..... E. Passburg  
Sulfuric anhydride. Making..... A. Clemm  
Surveyor's rod..... G. G. Heghinian  
Suspender end..... J. S. Sherer  
Suspenders and belt. Combined..... M. Goldin  
Switch indicator. End cell..... A. C. Walther  
Switch iron..... J. Flynn  
Synchronizing apparatus for alternators..... S. W. Mauger  
Synchronizing apparatus for alternators..... T. D. Boyles  
Tack driver and carpet stretcher. Combined..... E. Smith  
Talking machine record or record blank..... J. E. Alexander  
Tap blank grooving machine..... F. N. Gardner  
Tapping fixture..... G. H. Hollm  
Tapping lager beer kegs. Device for..... H. Hinz  
Telegraph office sounding mechanism..... J. C. Stewart  
Telegraph signals. Apparatus for relaying space..... 2 pats. J. S. Stone  
Telegraph signals. Relaying space..... 2 pats. J. S. Stone  
Telegraph signals. Simultaneously transmitting and receiving space..... J. S. Stone  
Telephone receiver..... 2 pats. K. B. Miller  
Telephone transmitter..... C. K. Knowles  
Tennis racket. Parlor..... H. W. Longfellow, Jr  
Theophyllin. Making..... M. Engelmann  
Therapeutic electrical apparatus..... I. E. Shaffer  
Thill coupling..... L. F. Torrey  
Thrashing machine cylinder..... J. G. Snyder  
Thrashing peas, beans, &c. Machine for..... J. W. Carnochan  
Tire cleaner. Bicycle..... J. B. Cahoon  
Tire for wheels. Resilient..... J. P. Legrand  
Tire holding device..... C. M. Starner  
Tire inserter and remover..... F. Boelk  
Tire. Metallic..... W. Thompson  
Tire. Pneumatic..... H. R. Palmer  
Tire protector. Rubber..... H. R. Palmer  
Tire setter..... J. E. Denham  
Tires. Device for inflating vehicle..... I. B. Catlin  
Tobacco stemmer..... J. O. Morris  
Tobacco stripping, booking and selecting machine..... F. G. Baechlin  
Tongue switch..... C. H. Krauss  
Tooth and anchor. Artificial..... S. S. Bloom  
Tooth crown and adjustable facing. Box..... B. W. Haines  
Tooth powder receptacle..... A. T. O. Holland  
Toy..... H. V. Lough  
Toy..... W. T. Soule  
Toy. Mechanical..... F. Hubsch  
Toy picture book..... S. Brentano  
Toy wind wheel..... F. A. Worden  
Train control system..... S. L. G. Knox  
Transformer..... S. E. Johannesen  
Transforming apparatus. Rotary..... A. G. Davis  
Tree moving apparatus..... A. F. Street  
Trolley connection and guard for electric cars..... J. G. Sharwell

Trolley stand..... H. Holland  
Trolley stand..... W. H. Kilbourn  
Trolley stand..... O. F. Lidke  
Trolley wire. Overhead electric..... J. P. Cribb  
Trolley wire support..... E. Hill Jr  
Trolley wires. Support for high tension..... A. F. Batchelder  
Truck and bag holder. Combined..... J. C. Steele  
Truck bolster..... J. H. Geer et al  
Truck. Car..... J. C. Wands  
Truck. Car..... H. S. Goughnour  
Truck. Car ball bearing..... R. V. Sage  
Truck. Car bogie..... J. A. Weimer  
Trunk elevating device..... C. W. Clifton  
Tubes or flues. Machine for cutting, expanding and beading..... J. Carmichael  
Tubes, pipe coils, &c. Manufacture of curved..... J. Earle  
Turbine. Elastic fluid..... T. G. E. Lindmark  
Turbine engine..... S. J. Webb  
Turbine. Steam..... J. Richards  
Turnip heads. Device for cutting off..... F. von Veltheim Ostrau  
Type setting and justifying machine..... F. B. Converse, Jr  
Type setting machine..... 2 pats. F. B. Converse, Jr  
Type-writer. Direct key lever..... A. C. Ferguson  
Type writer word counter..... R. Allen  
Type writing machine..... R. W. Uhlig  
Type writing machine..... G. B. Webb  
Type writing machine..... A. W. Cash  
Type writing machine..... W. P. Quentell  
Type writing machine erasure plate..... E. T. Reed  
Umbrella. Folding..... N. G. Deakins  
Underreamer..... J. C. Swan  
Valve..... L. Ehrhardt  
Valve. Air compressor..... E. Reynolds  
Valve. Automatic boiler feed controlling..... J. A. Baldwin  
Valve. Flush..... E. A. Marsh  
Valve for drinking troughs. Float..... E. C. Prowant  
Valve gear. Engine..... F. H. Sleeper  
Valve. Needle..... H. M. McCall  
Valve. Safety..... F. A. Casey et al  
Valve. Slow closing..... A. F. Blesch  
Valve. Throttle..... C. I. Shawver  
Valve. Variable speed safety..... M. Corrington  
Vamp throating die..... J. F. Dunn  
Vapor burner..... J. W. Master  
Vaporizer..... O. A. Johnston  
Vault. Burial..... G. B. Okey  
Vehicle body..... L. C. McLouth et al  
Vehicle coupling. Road..... L. H. Campbell  
Vehicle. Dumping..... C. H. Smith  
Vehicle. Motor..... H. P. Maxim  
Vehicle side dump..... T. Carroll  
Vehicle steering device..... H. J. Leighton  
Vehicle step..... A. F. Oietz  
Vehicle wheel..... C. W. Hunt  
Vehicle wheel..... J. Hopper  
Vehicle wheel lubricating device..... W. F. Probst  
Vehicle wheels. Device for transmitting rotary motion to..... O. Cluts  
Veneer drier..... A. S. Nichols  
Ventilator..... R. E. M. Bain  
Viscose and products derived therefrom. Treating..... C. F. Cross et al  
Vise..... J. Lewin  
Vulcanizer..... A. J. White  
Wagon boxes, &c. Apparatus for elevating and supporting..... G. E. Hall  
Wall bracket. Adjustable..... C. H. Richardson  
Washing machine..... W. C. Fawkes  
Washing machine. Clothes..... W. Thornton  
Water heater..... J. F. Yoho  
Water tube boiler..... T. Dunlap  
Water wheel..... J. H. Felthousen  
Wave motor..... A. Nelson  
Weather strip attachment for doors or windows..... G. A. Hills  
Well casing packer..... J. T. Callanan  
Well point and strainer. Drive..... G. Leeson  
Wells. Automatic water discharging apparatus for..... L. F. Hoffman  
Wells by direct air pressure. Apparatus for raising liquids, such as oil, from oil..... R. Stirling  
Wheelbarrow..... B. Tanner  
Wind engine..... C. McGregor  
Windmill..... J. H. Opfer  
Wind motor..... C. McGregor  
Wind wheel..... J. F. Hoag et al  
Winding machine..... J. O. McKean  
Windows, sashes, &c. Frame for sliding..... C. A. Walchner  
Wire or rope stretcher and fastener..... A. E. White  
Wire oscillators. Turning vertical..... J. S. Stone  
Wire weaving machine..... C. W. James  
Woodworking machine..... J. N. Rosen  
Wort cooler..... A. Zeiler  
Wrench..... M. Mahlen  
Wrench..... F. Deforge  
Wrench..... D. C. Hindman  
Wrench..... H. A. Westmoreland  
Yeast. Preparation of..... E. De Meulemeester  
Zinc and lead from sulfid ores. Extraction of..... G. C. Stone

### DESIGNS.

Bottle stopper..... R. Hudnut  
Clock case..... L. Hornberger  
Gas fixture bracket..... H. E. Watkins  
Gas fixture ornament..... H. E. Watkins  
Lamp shade..... R. D. Chandler  
Purse..... E. A. Sylvester  
Weighing machine case. Coin operated..... G. E. Van Guysling et al

Issued January 6, 1903.

### MECHANICAL PATENTS.

Account register and desk..... C. Paul et al  
Acetylene burner..... J. W. Bray  
Air and gas mixer..... C. A. Dally  
Air heater and steam generator..... T. S. C. Lowe

Alarm giving mechanism..... E. H. Juhlin  
Amusement apparatus..... B. Beerwald  
Anchor. Sea..... T. S. Miller  
Anvil shearing attachment..... C. A. Christenson  
Awl. Sewing..... I. D. Morgaridge  
Axle skein..... W. Lytle  
Bag forming machine..... L. F. Fales  
Baling press..... D. L. Nicholson  
Ball and socket joint..... J. C. Martin, Jr  
Bar severing machine..... H. S. McCool  
Barrel..... E. C. Phillips  
Basin. Adjustable wash..... M. Brandt  
Bath tubs, stoves, &c. Fastening device for..... W. S. Johnson  
Battery diaphragm..... F. A. Decker et al  
Bearing..... A. Ramsay  
Bearing. Ball..... F. W. Gurney  
Bearing. Shaft..... A. H. Reid  
Bed chair. Sick..... D. M. Moore  
Bed. Invalid..... B. R. Butler  
Bell. Alarm..... J. C. Schleicher  
Bending machine. Angular..... A. Tindel  
Beverages. Production of fermented M. Hahn  
Bicycle brake..... F. P. McElfresh  
Bicycle gearing..... C. Holst  
Billard or pool table cushion..... D. W. Delaney  
Binders. Loose leaf for temporary..... G. W. Weaver  
Blower. Steam..... E. Gibson  
Boiler furnace. Steam..... E. Gibson  
Boilers. Glass tube water gage for steam..... W. Bright  
Book. Coupon..... C. V. Sanderson  
Book. Loose leaf..... H. C. Miller  
Bottle..... F. M. Norris  
Bottle filler..... A. Schneider  
Bottle filling machine..... E. H. Schofield  
Bottle holder or support..... W. T. Holton  
Bottle. Non-refillable..... A. G. Stevens  
Bottle washing machine..... B. Gallagher  
Bottles or similar articles. Machine for washing..... B. Gallagher  
Brake shoe..... D. & H. Rawstron  
Brick kiln..... C. B. Platt  
Brick machine..... H. McIntosh  
Briquette making machine..... E. B. A. Zwayer  
Broom rack..... A. B. Lehman  
Brush. Combination floor, carpet and wall..... F. H. Loveless  
Brush holder..... W. W. Beeler  
Brush machine..... C. C. Harlow et al  
Brush. Metal finishing..... H. H. Hirsch  
Bucket and stand. Paste..... F. H. & W. C. Warren  
Buckle..... J. F. Atwood  
Buckle..... E. W. Hadley  
Buckle. Cotton tie..... P. L. Howlett  
Building blocks. Metallic matrix for..... W. C. Lyon  
Burglar alarm..... F. Puschnereus  
Burnishing machine..... W. J. & J. R. Mitchell  
Button. Collar..... H. G. Quimby  
Cable or wire shield for suspended cable track roads..... H. M. Harding  
Cake or doughnut cutter..... C. H. Brown  
Calculating machine. Electrically operated..... F. C. Rinsche  
Candy machine..... W. J. Morrison et al  
Car construction. Metallic..... C. B. Buhoup  
Car coupling..... A. L. Sherwood  
Car coupling..... 3 pats. E. Fabian et al  
Car coupling..... E. H. Janney  
Car coupling..... C. S. Enright  
Car coupling. Automatic..... G. A. Hermanson  
Car coupling. Safety..... S. D. Barnett  
Car draw bar spring. Railway..... J. F. O'Connor  
Car draw gear and puffing apparatus. Railway..... C. E. Felt et al  
Car. Dumping..... H. W. Wolff  
Car fender..... J. B. Robidon  
Car frame..... H. P. Field, Jr et al  
Car friction draft rigging. Railway..... 2 pats. J. J. Hennessey  
Car gate operating apparatus..... B. Rivkin  
Car replacer..... O. W. Johnson  
Car seat mechanism..... H. Tesseymann  
Car wheels. Manufacturing..... H. C. Buhoup et al  
Carpet fastener..... W. J. Doan  
Carpet stretcher..... H. C. Fehrmann  
Carriage and hearse. Combined..... C. Anderson  
Carriage. Baby..... C. F. Thayer  
Carriage brake. Baby..... W. H. Ramscar  
Carriage. Folding baby..... J. Mehlerber  
Centrifugal machine..... 3 pats. J. J. Berrigan  
Centrifugal separator..... E. Bardolle  
Chain link..... J. M. Dodge  
Chamber utensil and attachment therefor..... P. H. Dando  
Chaplet pointer..... J. A. Poole  
Chart. Transposition..... L. O. Woofis  
Chimney..... B. H. Miller  
Chisel. Carpenter's..... W. S. Ward  
Chocolate coating machine..... G. Carlson  
Churn..... G. G. Beynon  
Cigar shield. Pocket..... H. F. Drake  
Clay block grooving or scoring apparatus..... I. L. Conkling  
Clay block trimming apparatus..... I. L. Conkling  
Clover buncher..... C. C. Behm  
Clutch. Friction..... C. R. Gabriel  
Coach platform gear..... J. Knapp  
Coat and hat rack. Coin operated..... E. G. Lindheimer  
Coating with tin, &c. Machinery for pickling plates for..... J. E. Lewis  
Cock. Four way..... P. McDonald  
Coffin lowering device..... C. W. Wellman  
Coin controlled apparatus. Fraud preventive for..... H. S. Mills  
Coin package..... C. S. Batdorf  
Coke oven..... M. E. Rothberg  
Colter scraper attachment. Plow..... R. E. Miller  
Comb..... J. E. Head  
Combination lock..... J. B. Miller  
Concentrator..... J. S. Brownell  
Concrete mixer. Rotary..... W. J. Judd  
Condenser. Steam..... C. E. Nicholas  
Confectionery coating machine..... G. Carlson  
Cooking utensil..... R. T. Astle  
Copper from its ores. Extracting..... A. von Garnet  
Cork sorting machine..... G. H. Vincke  
Corner brace..... J. P. Johnson

Cow tail holder..... W. Noxon  
Crane. Electric..... J. H. Holland  
Crate. Bottle..... P. Linker  
Cream separator..... L. E. Siebenhaar  
Cuff holder..... H. S. Pond  
Cultivator..... J. S. Howell  
Cultivator attachment..... J. M. Brewer  
Cultivator replanting attachment..... J. & T. M. Hendrickson  
Curtain pole or rod..... E. C. Phillips  
Curtains. Adjustable support for roller..... W. J. Lightner et al  
Cut off. Automatic..... B. F. D. Miller  
Cutter and tool grinder..... W. Oesterlein  
Cycles for use as a hand rest or parcel carrier. Attachment for..... T. R. Ellison  
Damper regulator..... A. Carmichael  
Decoy duck..... F. H. Yorke  
Dental broach..... W. J. Miles, Jr  
Diffusion process..... C. Steffen  
Display cabinet..... W. E. Howry  
Display counter..... I. N. Landauer  
Ditching and ridging machine..... L. L. Hardin  
Door check..... G. E. Colman  
Doors. Device for opening laterally moving..... 2 pats. J. J. Hennessey  
Drafting instrument. Combination..... J. Leitschuh  
Dress shield..... L. M. Ferguson  
Drill..... G. W. Hays et al  
Dust pan..... G. G. Tichenor  
Dye and making same. Azo..... W. Voigtlaender-Tetzner  
Dye and making same. Mixed disazo..... C. Schraube et al  
Dye. Making black polyazo..... J. Dedichen  
Dyeing..... O. Jaek  
Electric conducting cable..... R. Spaulding  
Electric energy to translating devices. Controlling the supply of..... H. W. Leonard  
Electric switch..... W. R. Thompson  
Electrical regulator..... C. P. Philbrick  
Electrode. Storage battery..... 2 pats. L. Paget  
Electrodes. Preparing storage battery..... L. Paget  
Embroidering machine..... J. A. Groebli  
Engines. Electric igniting device for internal combustion..... F. R. McMullin  
Envelope..... M. L. Hinchman  
Excavating machine..... E. A. Mathers  
Excavator..... W. H. Fulcher  
Eyeglass nose guard. Reissue..... H. Borsch  
Feed and presser roll. Sectional..... C. J. L. Meyer  
Feed mechanism..... S. Upton  
Feeder. Time stock..... G. J. Stein  
Fence post..... J. T. Crow  
Ferrules. Die or mold for forming..... J. B. Oelkers  
File and binder. Paper..... H. G. Whitmore  
File. Bill..... C. O. Grimes  
File cabinet. Rotary..... L. S. Perkins  
Filter..... C. Scudder  
Filter..... J. M. Vaughan  
Firearm..... J. C. White  
Fire-escape..... H. Fahldiek  
Fire-escape..... R. Toennes  
Fire extinguisher..... E. S. Buckland  
Fish trap. Floating..... A. C. Burdick  
Fishing implement. Odorized..... T. B. Hodge  
Food chopper..... O. D. Woodruff  
Fruit picker's bag..... J. B. Williams  
Fuel feeding device..... N. E. Shontz  
Furnace..... H. E. Kent  
Furnaces. Device for regulating and controlling the supply of gas and air to..... D. Turk  
Gage..... S. E. Smith  
Gaining tool. Hand..... R. P. Mathews  
Game board..... J. E. Patton, Jr et al  
Garbage digesters. Drainer for..... E. S. Peck  
Garment..... E. A. Holston  
Garment fastener..... G. H. Dillin  
Garment fastener..... S. S. Spofford  
Garment hanger..... S. H. Rimball et al  
Garment supporter..... J. C. Strickland  
Garter..... E. Gutmann  
Garter supporter..... M. L. Buckau  
Gas analysis apparatus..... M. Aradt  
Gas and air regulating valve..... E. E. Kerns  
Gas burner..... A. H. Humphrey  
Gas burner..... J. Kelly  
Gas generator. Acetylene..... J. de Dios Tejada  
Gas heater burner..... W. E. Fitch  
Gas. Safety means for distributing acetylene..... M. Toltz et al  
Gas valve. Thermal..... W. C. Norton  
Gate..... P. A. McCarville  
Gem setting..... G. W. Dover  
Goods in vats. Machine for automatically folding..... S. C. Turner  
Grain elevator. Pneumatic..... J. C. Rieth  
Grip device. Intermittent..... P. A. McCarville  
Grubbing sage brush. Machine for..... W. O. White  
Gun. Automatic..... J. Weed  
Gun carriage..... J. F. Meigs et al  
Gun firing mechanism..... A. T. Dawson et al  
Gun. Magazine..... J. Hyland  
Gun mounting..... A. T. Dawson et al  
Guns. Combined recoil check and counter recoil check for..... J. F. Meigs et al  
Harvester reel..... M. V. Tucker  
Harvesting machine..... P. B. Richards  
Hat brim shaping pan..... W. Glazier  
Hat fastener..... E. D. Schultz  
Hat fastener..... W. F. Murphy  
Hat. Husk..... S. C. Heard  
Headlight for street cars, &c. Adjustable..... G. F. Chapman  
Heating apparatus..... I. D. Smead  
Heel breasting machine. 2 pats. W. J. Mitchell  
Hod elevator..... A. Gartner  
Hoop finishing machine. Wire..... G. V. Willson  
Horse power and pressure indicator and recorder. Automatic..... E. Fortier  
Horseshoe. Composition..... G. J. Peacock  
Hub. Wheel..... C. F. Nissen  
Hydrocarbon burner..... W. J. & G. Lane  
Hydrocarbon burner..... F. M. Baker



Hydrocarbon burner and attachment..... W. J. & G. Lane  
Ice cream freezer..... B. B. Messer  
Ice pick..... H. Huebner  
Illuminating canopy..... F. L. O. Wadsworth  
Illuminating structure..... 2 pats.  
Instep support or arch prop J. W. Arrowsmith  
Ironing board fastening device..... E. R. Robinson  
Ironing machine..... H. H. Graack  
Joining, Cast..... E. A. Pettit  
Keyless lock..... L. P. Keller  
Kiln for firing china, glass, or other ware..... H. Thiemler  
Lace tip..... G. A. Getty et al  
Lantern..... J. H. Hill  
Lantern, Hand..... F. V. Benson  
Lathe..... C. Seymour  
Lever, Shifting..... M. C. Johnson  
Levers, Supporting bracket for unlocking..... J. Timms  
Link, Weldless..... H. L. Ferris  
Loading apparatus, Wagon..... G. A. Babbitt  
Loading attachment, Wagon..... J. Murphy  
Loading or unloading device..... J. L. C. Quella  
Lock..... S. C. Houghton  
Lock and latch, Combined..... L. H. Mullikin  
Locking device, Keyless..... H. W. Standidge  
Locomotive nozzle tip..... D. Grattan  
Loom reed..... F. Ott  
Loom shuttles, Automatic tension device for..... A. Baldwin  
Loom shuttles, Pneumatic driver and cushion for..... J. C. Blundell  
Loom stopping device..... R. Howarth et al  
Mail bag catcher, Automatic..... G. A. Hughes  
Manifolding device..... E. Leiser  
Marker, Land..... A. A. Elder  
Match box..... J. H. Fulton  
Match machine..... W. E. Cook  
Mattress..... J. McCarty  
Mattress filler..... G. W. Wareham  
Mechanical movement..... J. D. McFarland, Jr  
Mechanical movement..... F. Streich et al  
Mechanical movement..... H. Theissen  
Metal pieces, Joining..... H. Goldschmidt  
Milk and product thereof, Treating..... J. H. Campbell  
Mill..... G. M. Kemp  
Mirror, Shaving..... L. E. Painter  
Molding apparatus..... S. Shaw  
Molding machine, Sand..... G. G. Howe  
Motor..... A. B. Roney  
Mower, Lawn..... F. L. Adams  
Multiple engine..... T. G. E. Lindmark  
Music sheets for mechanical musical instruments, Machine for cutting..... W. S. Pain  
Musical instrument, Mechanical..... A. Junod-Turin  
Musical instruments, Melody stop for mechanically played..... R. W. Pain  
Nail bin..... H. O. Amundson  
Napping machine..... G. W. Greene  
Newspaper holder..... F. W. Miller  
Nut lock..... J. A. Mell  
Oar, Bow facing..... L. W. Flint  
Oil burner..... G. W. Smith  
Oiler, Air pump piston rod..... W. Cooper  
Oiler for mining cars, Automatic..... R. S. Walker  
Ordnance..... O. Lauber et al  
Ores, Treating..... J. T. Jones  
Oscillator..... H. Shoemaker  
Oven, Baker's..... C. F. Ingelmann  
Packer..... C. W. Ellis  
Padlock, Permutation..... T. King  
Paintings on glass, Producing imitations of..... H. Titze  
Paper bag..... F. A. Read  
Paper exhibitor, Wall..... T. J. Beard  
Paper hanging machine..... D. M. McCanless  
Paper holder..... A. E. Sexton  
Paper, Producing water marked..... E. R. & O. F. Behrend  
Paper stock refining engine..... H. G. Saecker  
Paper vessel..... J. Single  
Pen cleaner..... W. E. Miller  
Pen or pencil attachment..... W. C. Murphy  
Pen, Self filling fountain..... H. B. Levy  
Pencil..... A. Fornander  
Photographic films, Manufacture of..... L. M. J. Armandy  
Photographic plate holder..... F. V. Matthews  
Photographic printing frame..... A. Holmes  
Photographic purposes, Machine for ruling screens or plates for..... E. E. Flora  
Piano..... L. W. Norcross  
Piano or organ keyboard..... T. W. Wiehmayer  
Picture hanger..... C. Jackson et al  
Pile supporter..... K. Clark  
Piling apparatus..... C. Mercader  
Pin joint..... G. W. Dover  
Pinch bar..... M. A. Sheldon  
Pipe coupling..... J. Willmann  
Pipe renovator, Water..... R. W. Hellums et al  
Pipe wrench..... J. Bartlett  
Pipe wrench..... L. W. Johnson  
Pliet holder..... H. N. Northrop  
Plant thinning machine..... J. J. Barron  
Planter..... A. C. Dann et al  
Plaster-of-paris, Apparatus for forming cornices or ornamental moldings from..... I. L. Conkling  
Pliers, Valve..... J. E. Barney  
Plow..... L. A. Willbanks et al  
Power translating device..... G. W. Marble  
Protracting device..... A. S. Prall  
Pulley, Friction clutch..... C. F. Duke et al  
Pulp, Press for making spools from fibrous..... E. Hubbard  
Pulverizer..... H. Ariens et al  
Pump..... T. G. E. Lindmark  
Pump, Air..... A. A. Phipps  
Pump having rotary operating mechanism, Air or liquid reciprocating..... G. W. Johnston  
Pump, Mining..... J. K. Hogan  
Pump mounting..... H. C. Jones  
Pumping apparatus..... F. J. Donoghue  
Purse..... R. Malzahn  
Rail anchor..... B. Burgess  
Rail fastening apparatus..... D. L. Winters  
Rail joint..... C. Gommon  
Railway brake..... G. Houplain  
Railway crossing..... A. H. Lewis et al  
Railway curve, Street..... A. C. Wells  
Railway gate, Automatic..... C. E. Mickley  
Railway rail..... W. H. Haight  
Railway rail..... W. P. Cunningham  
Railway signal..... J. Williams

Railway switch..... J. P. Hasty  
Railway switch, Automatic street..... J. R. Klippelt et al  
Railway switch stand..... M. Waters et al  
Railway track securer..... J. H. Crowley  
Rake tooth testing machine..... J. W. Pridmore et al  
Reclining chair..... J. H. Travis  
Recording instrument..... C. C. Jones  
Refining engine..... 2 pats..... S. R. Wagg  
Retorts, Apparatus for charging inclined..... W. R. Herring  
Ribbon tie..... C. E. Smith  
Rolling mill..... J. R. George  
Rolling mill, Car wheel and tire..... H. C. Buhoup et al  
Roof structure..... H. Aiken  
Rotary drill..... D. F. Seed et al  
Rotary engine..... H. W. Carpenter  
Rotary engine..... T. W. Neely  
Rotary engine..... M. E. Knight  
Rotary engine..... J. M. McCulloch  
Rudder, Ship's..... O. S. Mears  
Rule and blotter, Combined..... W. H. Ramsey  
Sack holder..... E. Taylor  
Safe, Buoyant..... F. Honeck et al  
Sash lock and alarm..... C. W. Linn  
Saw..... J. Schmidt, Jr  
Saw, Gang..... E. E. Thomas  
Saw mill, Double cutting band..... H. G. Dittbenner  
Saw set..... L. O. Anderson  
Saw teeth, Device for side filing..... F. D. Foggin  
Scale, Weighing..... G. W. Taylor  
Scoop board, Vehicle body..... W. W. Patterson  
Scraper and grader, Road..... C. A. Slaughter  
Screw driver..... F. C. Greene  
Sealing sheet metal cans or vessels, Vacuum..... E. Norton  
Seed cotton distributors, Automatic relief valve for pneumatic..... G. W. Wade  
Separator..... E. Colvin  
Sewing machine needle actuating mechanism..... E. P. Hatch  
Shade fixture..... T. G. Wonderly  
Shade trimming device, Window..... C. H. Bell  
Shaft supporting device..... M. C. Johnson  
Sharpener, Disk..... P. Caffarel  
Sheet metal can, Vacuum sealing..... E. Norton  
Show case base..... L. Paille  
Sign illuminator..... J. H. McMullin  
Signaling system..... 3 pats..... H. Shoemaker  
Signaling system, Multiplex wireless..... H. Shoemaker  
Signaling system, Wireless..... 4 pats..... H. Shoemaker et al  
Signaling system, Wireless selective..... C. D. Ehret  
Sleigh runner..... S. R. Ford  
Smoke consuming furnace..... C. J. Shoemaker  
Smoke consuming furnace..... Reissue..... H. E. Parson  
Snow plow and road icer..... M. Ferguson  
Snuff or tobacco box..... F. M. Rowe  
Soap dispensing apparatus..... N. J. Crowell et al  
Soldering apparatus, Can..... F. P. McColl  
Soldering sticks, Composition for making..... O. J. Flanagan  
Soldering tool, Self heating..... C. J. Thorngren  
Sounding apparatus..... J. F. Lewis  
Spinning frame traveler..... A. Ivon  
Spring clamp..... N. A. Westbrook  
Sprocket wheel for drive chains..... J. M. Dodge  
Square, T and angle..... J. Brauchli  
Stacker, Hay..... W. Saighman  
Starch, Apparatus for manufacturing..... A. P. Murdoch  
Starch, Manufacturing..... A. P. Murdoch  
Steam boiler..... C. R. Sayre  
Steam engine, Double acting..... J. Deneal  
Steam generator..... J. Deneal  
Steam generator..... 2 pats..... H. E. Penny  
Steam or hot water heater..... J. C. Barrett  
Sterilizer..... J. P. Lord  
Stethoscope or the like..... R. P. McCully  
Stirrup..... H. E. Hey et al  
Stone boring machine..... J. P. Murphy  
Stone cutting machine..... C. L. Payne  
Storage battery and preparing electrodes therefor..... L. Paget  
Storage battery, Electrical..... H. K. P. Barham  
Stove flue, Safety..... F. C. Melsha  
Stove hood..... A. Anderson  
Stovepipe boiler..... M. G. Strickland  
Stovepipe collar..... E. J. Campbell  
Stoves or heaters, Flue construction of gas burning..... S. B. Harvey  
Studding..... J. W. Rapp  
Sugar refining apparatus, Loaf..... M. Gevers  
Supporting rack..... J. A. Donnelly  
Surgical chair..... C. H. Patrick  
Suspenders..... C. R. Harris  
Switch stand or Semaphore..... A. K. & G. L. Mansfield  
Switch terminal..... G. W. Hart  
Synchronizer..... H. Shoemaker  
Talking machine..... L. P. Valiquet  
Tea kettle cover..... W. N. Ickes  
Telegraph system, Quadruplex..... J. F. Skirrow  
Telegraph transmitter..... C. T. Bourk  
Telephone exchange systems, Automatic conversation counter for..... J. H. Meyer  
Telephone line testing system..... W. W. Dean  
Telephone receiver holder..... J. B. McClain  
Tempering furnace, Section..... G. W. Packer  
Thermometer case..... T. Sandhro et al  
Threshing machine, Grain..... W. Maloney et al  
Ticket, Combined railway fare and transfer..... F. W. Gillard  
Tie plate..... J. H. Crowley  
Tile for lining silos..... E. E. Blaschke, Jr  
Time detector contact device..... H. W. Durkee et al  
Tire for vehicle wheels, Spring..... W. T. G. Ellis  
Tobacco pouch..... E. Hafer  
Tool, Combination..... F. A. Robbins  
Tool, Hand operated..... R. P. Charles et al  
Tool holder and cutter..... J. M. Normand  
Top, Spinning..... A. H. Munsell  
Torpedoes, Apparatus for handling automobile..... B. A. Fiske  
Torch, Hydrocarbon..... C. Flizer  
Tower, Tilting..... T. O. Perry  
Trenching machine..... H. J. Bentson  
Trolley..... J. T. Rice  
Trolley, Electric car..... W. A. Daggett  
Trolley harp..... F. J. Caswell et al  
Trolley pole and stand therefor..... W. H. Kilbourn  
Truck, Car..... 2 pats..... J. Timms

Truck, Mill..... C. Koegel  
Truck, Railway car..... J. F. O'Connor  
Tube cleaner..... G. O. Rawson et al  
Tube extractor..... F. McWilliams  
Tube splicing..... J. Humphreys  
Tubes or hollow articles, Making seamless..... C. Mercader et al  
Tumbling barrel..... J. H. Conkling et al  
Turbine, Elastic fluid..... T. G. E. Lindmark  
Type casting and setting machines, Device for casting justifying spaces in combined..... C. Rozar  
Type setting machine..... E. A. Adcock  
Type writing machine..... G. C. Blickensderfer  
Type writing machine..... C. Gabrielson  
Type writing machine..... F. H. Armstrong  
Type writing machine..... C. Gabrielson  
Valve..... H. Ritter  
Valve controller, Cut off..... G. H. Clover  
Valve, Filling..... A. Schneider  
Valve gear, Gas engine..... J. C. White  
Valve mechanism..... C. B. Edwards et al  
Valve mechanism and connected parts..... C. C. & E. A. Riote  
Valve seat for explosive engines W. M. Harvey  
Vehicle, Knockdown drop body..... A. G. North  
Vending apparatus..... L. J. Smith et al  
Vending machine..... F. C. Connor  
Veneer drier controlling mechanism..... A. S. Nichols  
Veneer drier controlling mechanism..... N. Windsor  
Vessel loading device..... F. Honeck et al  
Vessels, Closure for storing and dispensing..... H. C. Enrich  
Wagon box..... F. Fisher  
Wagon, Truck..... E. H. Tyler  
Waistband..... L. P. Kleiderer  
Wall decorations, &c. Composition of matter for the manufacture of..... J. Thame  
Wall tie..... R. C. Taft  
Washing machine..... S. Hayes  
Washing machine gearing..... I. S. Diehl  
Watch, Stop..... O. F. Ostergren  
Water bag..... T. Gregory  
Water closet..... P. A. Allen  
Water, Softening..... F. Breyer  
Water tube boiler..... J. T. Smith  
Water tube boiler..... H. E. Penney  
Weather strip..... C. Vose  
Weeding implement..... G. O. Palmer  
Weighing mechanism for barrow trucks..... V. Weidinger  
Wheel for cars, &c. Self locking loose..... C. J. Gustafson  
Windmill regulator, Automatic..... P. A. Anderson  
Wind motor..... L. Soria y Hernandez  
Window..... A. W. Cooper  
Wire breaking tool..... W. G. Coffin  
Wire cutting machine..... G. M. Depew et al  
Wire cutting machine..... G. V. Willson  
Wire drawing machines, Frame for..... M. Reid  
Wire, Machine for cleaning, straightening, and re-insulating old..... F. W. Henninger  
Wire, Machine for forming twisted joints with..... G. M. Depew  
Wire spiraling machine..... G. M. Depew  
Wire stretcher..... J. E. Price  
Wire twisting machine..... J. V. Willson  
Wood pipe..... I. D. Smead  
Wrench..... T. E. Campbell  
Wrench attachment..... W. S. Lenhart

## DESIGNS.

Braid..... 2 pats..... H. P. von Nostitz  
Candlestick..... G. L. Crowell, Jr

Issued January 13, 1902.

## MECHANICAL PATENTS.

Adding machine..... J. C. Lotterhand  
Adjustable chair..... T. M. McKee  
Air brake cylinders of engines and tenders, Instantaneous release for the..... T. A. Seery  
Air or other aeriform fluids, Apparatus for the liquefaction of..... C. Joly  
Antifriction end thrust device..... 2 pats..... S. S. Eveland  
Balance escapement dust cap..... P. Moosmann  
Bale tie..... A. M. Lander  
Balloons, Seamless rubber..... D. Harris  
Bank, Savings..... J. H. Zimmer  
Bath cabinets, Head cap for vapor..... J. B. Davison  
Battery..... L. Begeman  
Bayonet..... B. F. Perry  
Bearing, Roller..... A. E. Henderson  
Bearing, Shaft and axle..... H. O'Reilly  
Beer pipes, Device for cleaning..... A. Muller  
Bell..... C. Banknecht  
Bell and door knob, Combined..... T. E. Creclius et al  
Belt shifter..... J. J. Leahy et al  
Bending machine..... J. Krueger  
Bevel and square, Compound..... T. V. Hampton  
Beverages, Apparatus for dispensing gas impregnated..... E. Adam  
Bicycle leading attachment..... J. B. Davis  
Bicycle seat post clamp..... J. H. Rast  
Bilge water discharging apparatus..... J. R. Jobin  
Blacking machine, Boot..... J. A. De Vito  
Blast furnace..... W. C. Coffin  
Boat, Submarine..... C. B. Gillette  
Boiler water gage, Steam..... F. Strandberg  
Book and carbon carrier therefor, Manifold..... G. B. Doyle  
Book mark..... P. Swan  
Bordeaux mixture and making same..... F. J. Smith  
Bordeaux mixture and preparing same..... F. J. Smith  
Bottle, Non refilling..... L. E. Wentworth  
Bottles, Apparatus for simultaneously filling a number of..... S. Hyden et al  
Bowling game..... O. Schwidetzky  
Bowling game apparatus, Coin operated..... R. E. Gatter  
Box for bottles, candy boxes, &c..... C. A. Brackett  
Brick machine..... C. E. Hendricks  
Brick or tile cutting machines, Receiving table for..... J. Bensing  
Bridle bit, Reversible..... H. P. Smith  
Brush..... J. R. Grundy  
Buckle..... F. Barr  
Buffing machine..... 2 pats..... J. A. Pine

Building block lifter..... L. P. Normandin  
Building block manufacturing machine..... L. P. Normandin  
Building construction..... H. D. Conway  
Building substructures, Making..... J. M. Ewen  
Button, Collar or cuff..... A. H. Stemme  
Button making machine tool holder..... C. W. Pelton  
Cages, Lifting rails for self-dumping..... H. L. Jackson  
Calculating machine keyboard..... W. T. Treadway  
Callipers, Vernier and micrometer..... F. G. Marbach  
Cameras, Sensitized plate for photographic..... A. A. Brooks et al  
Can or vessel safety attachment..... L. Kessler  
Canopy support..... J. Magfur  
Car brake, Emergency..... H. Fresh  
Car door..... F. L. Greer  
Car draft rigging, Railway..... H. Bruns  
Car fender..... J. F. Verner  
Car, Railway..... C. Zimmerman  
Car roof..... J. J. McCarthy  
Carbons, Manufacturing electrolytic or electric light..... 2 pats..... H. H. Dow  
Carbureting apparatus, Air..... T. H. J. Leckband  
Card clothing, Means for securing..... E. Jones et al  
Carding engine..... G. Laurency  
Carding machine feed mechanism..... H. Kemp  
Carriage spring..... J. Maille  
Case..... D. H. Sanders  
Cash register..... J. P. Cleal  
Caster..... G. A. Rentschler et al  
Caster, Ball..... M. Hagie  
Cautery..... J. P. Muller et al  
Cementation process..... A. Frank  
Centrifugal regulator, Indirectly acting..... C. Schmitthenner  
Chair attachment, Rocking..... F. Siegrist  
Chuck, Work holding..... G. de Laval et al  
Churn dasher, Rotary..... M. J. Stetson  
Chute head, Swivel..... P. B. Clarke  
Cistern..... D. Lemley  
Clipper, Hair..... G. H. Coates  
Clock, Geographical..... I. F. Phells  
Cloth, Tenting..... A. Mitchelsen  
Clothes line..... F. S. Brown  
Coffee mill..... W. Pearcy  
Coffee roaster, Electric..... G. C. Lester  
Collar foundation..... A. M. Weber  
Combining machines, Pressure applying device for rolls of..... P. Smith et al  
Conveying apparatus..... G. A. Amsden  
Corn husking machine..... F. C. Ielfield  
Corn picker..... J. M. Gallaher  
Cot, Folding..... C. G. Rundqvist  
Cotton thinner..... G. L. Green  
Cows' tails, Device for preventing the switching of..... D. McLeellan  
Crate, Shipping..... E. G. Tufts  
Cream and butter separator..... J. G. Cunningham  
Crose tie and rail fastening..... A. B. Allen  
Crucible shaker..... W. S. Mather  
Culinary vessel..... W. M. Merritt  
Cultivator attachment..... W. Hoffer  
Cultivator, Harrow..... S. M. Davis  
Currents, Generating alternating..... 2 pats..... C. S. Bradley  
Curtain cord catch pulley..... G. M. Frampton  
Cushion for chairs, &c..... W. & B. Ritter  
Cushion spring..... W. R. Smith  
Cut off for drain pipes, Automatic..... L. E. Lemley  
Cyan methyl derivatives of aromatic amides, Making..... O. J. Graul  
Cycle wheel, Motor..... A. Clement  
Damper regulator, Steam boiler..... F. H. Cyrenius  
Dental engine attachment..... C. R. Basford  
Dental finishing strip package..... J. A. Thomas  
Dish washer..... A. M. Dunder  
Display stand..... P. Misner  
Distilling apparatus, Portable..... J. Kirkaldy  
Door closer and insect excluder, Combined..... J. A. Ramsey  
Door hook..... A. E. Strang  
Door lock and burglar alarm..... L. H. Handy et al  
Door telltale..... T. O'Toole  
Draft equalizer..... B. Washam  
Draft equalizer..... N. E. Bailey  
Draft regulator..... S. F. Hicks  
Dredger..... R. A. Perry  
Dumb waiter safety appliance..... H. Donohoe  
Dust arrester for hot air pipes..... L. D. Young  
Dust guard..... J. W. Green  
Dye and making same, Blue wool..... A. Weinberg  
Dye and making same, Sulfurized cotton..... L. Haas  
Dye, Red azo..... P. Julius  
Dye, Red azo..... C. Schraube et al  
Eaves trough hanger..... E. E. Brott  
Edge gage..... E. A. Stiggins  
Educational frame..... J. H. Prosser  
Egg separator..... J. L. Voigt  
Electric battery..... M. R. Hutchison  
Electric cut out..... C. Wagner  
Electric motor..... E. S. Pillsbury  
Electric motor or generator..... J. A. Titzel, Sr  
Electrolytic apparatus..... M. Haas  
Electromechanical movement..... E. S. Lorimer  
Electrotype plates and molds, Machine for planing..... A. Elliott et al  
Elevator..... W. H. B. Teamer  
Elevator stop device, Automatic..... G. W. Nistie  
End gate..... A. J. Diggins  
End gate, Vehicle..... A. Fiscus  
Engine cranks, Manufacturing..... J. P. Brophy  
Engine igniter apparatus, Gas..... W. P. Flint  
Engine muffler, Gas or gasoline..... J. F. Kurtis et al  
Engines, Cooling means for explosive..... F. A. Law  
Engines, Mixing device for explosive..... H. F. Wallmann  
Envelop..... E. H. Christensen  
Explosion engine..... J. A. Osterberg  
Fabric pin..... G. W. McGill  
Fabrics, Composition for coating..... M. G. Peters et al  
Fare indicator..... O. Kuntzen et al  
Farming implement..... W. B. Smith  
Farriery machine..... S. J. McDonald  
Feed cutter..... W. G. St. John  
Feed tripping mechanism..... J. Parker



Feed trough.....J. J. Smith  
Feed trough for animals.....J. H. Snow  
Feed water heater. Locomotive.....A. T. Fox  
Feeder. Calif.....F. W. Moseley  
Fence tool. Wire.....F. Canfield  
Fertilizer distributor.....E. F. Needham  
File and register for papers or documents.  
Letter.....G. M. Kneuper  
Filter.....C. A. Conn  
Filter press.....W. Sommer  
Fire alarm pistol.....C. E. Lombard  
Fire extinguishing sprinkler. Automatic.....  
Fireproof building construction.....W. L. Cooper  
Fireproof floor.....J. T. O'Brien  
Fish grapple.....H. Marling  
Fish line reel retaining device.....C. A. Bindhammer  
Fishing reel.....C. A. Tredwell  
Fluid container or receptacle.....A. W. Bishop  
Fluid pressure mechanism.....C. F. Kade  
Fluid under pressure. Means for transmitting.....H. R. Mason  
Flushing tank. Closet.....W. S. Halsey  
Flushing tank. Closet.....W. A. Williams  
Folding box or crate.....A. B. Jaquith  
Fourdrinier machine attachment.....J. E. Webb et al  
Fringing machine.....A. S. Horlacher  
Fruit packing apparatus.....C. A. Braun et al  
Furnace.....H. L. Meyer  
Furnace blast apparatus. Downdraft.....R. W. Hamann  
Furniture nail.....R. L. Ellery  
Fuse. Shell percussion.....W. Ruegg  
Game apparatus.....R. Ireland  
Game board. Convertible.....N. B. Stone  
Game table.....J. T. Nientimp  
Garbage burner and water heater.....J. Mann  
Garment clasp.....A. H. Cohn  
Garment fastening device.....H. E. Finney  
Garment supporter.....H. Bavier  
Garment supporter attachment.....E. L. Pitts  
Gas and air mixer.....J. F. W. Jost  
Gas burner. Incandescent.....C. Scott Snell  
Gas governor.....J. Zander  
Gear. Worm.....G. Stahle  
Glass annealing apparatus.....W. D. Keyes  
Grain drill.....F. R. Packham  
Grain drill disk furrow openers. Bearing for.....F. R. Packham  
Grain. Machine for separating garlic and  
cockle from.....J. H. Dawson  
Grain separator blower pipe.....J. Riester  
Grate.....I. D. Smead  
Grinding machine.....M. O. Kasson  
Grinding machine.....G. M. Luther  
Groove cutting machine.....W. G. Sanborn  
Hair pin.....E. Brown  
Harness for breaking and training horses.....W. D. Carson  
Harvester and husker. Corn.....J. V. W. W. & W. Campton  
Hat polishing machine.....D. Rosenberg et al  
Headlight.....F. Kappel  
Heating furnace.....F. H. Daniels  
Hedge trimmer.....F. S. Voo hees  
Heels, &c. Cushion thread for.....H. F. Rooney  
Hinge. Door.....J. M. Canion  
Hoof pad. Yielding.....T. Ryan  
Hook.....C. S. Purdy  
Horizon. Artificial.....J. T. Edwards  
Horseshoes. Overshoe for.....C. Scudder  
Hot air register.....C. H. Foster  
Hydraulic apparatus.....A. S. Cardella  
Hydrocarbons and alcohol and products  
thereof. Solidifying volatile.....A. H. Cronmeyer  
Hydrogen sulfid from furnace gases. Making  
pure.....W. G. Waring  
Ice elevator.....N. H. Trask  
Incubator.....F. C. Keck  
Inhaler.....C. W. Taylor  
Insulating lining and making same.....G. B. Painter  
Internal combustion engine.....W. Langdon Davies et al  
Jar wrench.....E. F. Tiemann  
Joiner's clamp.....W. R. Tucker  
Journal bearing.....P. T. J. Monson et al  
Journal box.....2 pats. J. W. Stephenson et al  
Kaleidoscope.....U. Diem  
Lace edging.....G. W. Merrow et al  
Ladle crane.....F. A. Rundle  
Lamp mantles. Loop for incandescent.....C. Simon et al  
Lamp. Miner's.....J. Jacobsen  
Lamp socket. Switch.....F. D. Spear  
Lamps. Treating glowers for direct current  
electric.....M. W. Hanks  
Lantern.....B. J. Downing  
Latch.....W. H. H. Decker  
Lens wrapper.....E. Riggs  
Lenses or the like. Temple and spring clamp  
for.....E. L. Lembke  
Lewis bolt.....N. W. Rancourt  
Lifting jack. Screw.....J. C. Covert  
Lighthouse or similar apparatus.....J. A. & W. T. Purves  
Lime or cement kiln.....C. S. Batchelder  
Linoleum. Manufacture of patterned.....K. Klic et al  
Liquid separator. Centrifugal.....C. A. & O. W. Hult  
Loaf forming device.....J. B. Heydt  
Lock telltale.....J. Koerber  
Locket.....L. A. Blackinton  
Loom. Automatic filling replenishing.....J. Northrop  
Loom. Filling replenishing.....J. Northrop  
Loom. Filling replenishing.....E. S. Stimpson  
Loom. Weft-operated controlling device.....F. Sameck  
Looms, &c. Beam latch or dog for.....J. T. Meats  
Lubricating device.....F. L. Hawkins  
Mail box.....A. M. Burnham  
Mail box locking system.....J. E. Walsh  
Mandrel.....E. I. Braddock  
Marine boiler. Combination Scotch and water  
tube.....A. E. Roberts  
Marine conveyer.....T. S. Miller  
Massage implement.....M. A. Sullivan  
Mat casing.....E. L. Perry  
Match box making machine.....H. C. La Flamboy  
Match machine.....M. A. Sheldon  
Measuring device.....H. Smith  
Meat tenderer.....G. Holmgren

Mercury test gage.....G. A. B. Spencer et al  
Metal clip.....W. J. Baker  
Metal clip for use in steel building construction.....H. A. Streeter  
Metal rods, &c. Manufacture of.....F. Tomlinson  
Milk. Making desiccated.....J. H. Campbell  
Mine gate.....J. M. Marty  
Mold emptying apparatus.....J. C. Reed  
Molding and vulcanizing apparatus.....R. H. Smith  
Molding apparatus.....G. B. Painter  
Molding machine.....J. A. Field  
Mowers, &c. Cutting apparatus for.....H. L. Hopkins  
Mowing machine. Grass.....P. Holfert  
Music holder.....J. N. Chadwick  
Music roll.....G. B. Kelly  
Music roll for mechanical musical instruments.....F. L. Young  
Musical instrument.....P. G. Archute  
Musical instrument.....A. Schoenhut  
Musical instrument scale.....D. H. Haywood  
Musical instrument string receptacle.....H. E. Finney  
Necktie fastener.....G. Borst  
Nest. Hen's.....L. J. Du Pree  
Nut. Carriage axle.....N. Tebo et al  
Nut lock.....S. Freund  
Nuts. Machine for making tracker.....D. Frothingham  
Oiler. Vehicle hub.....P. H. Fishell  
Optometer.....E. F. Waits  
Ores. Reducing.....S. C. C. Currie  
Organ bellows. Electrically controlled.....E. R. Whitney  
Oven. Baking.....P. E. Laskowski  
Packing. Stuffing box.....L. Hauslehner  
Padlock. Combination.....J. Nielander  
Paint or water color receptacle.....J. M. Adamson  
Pan ring for coppers.....W. T. Row  
Paper bag machine.....S. T. Murchie  
Paper box blanks. Machine for cutting the  
corners of.....L. A. Mayall  
Paper or other materials. Machinery for  
cutting and padding.....C. P. Cottrell  
Paper or other materials. Machinery for  
cutting and folding.....E. H. Cottrell  
Patterns. Device for drafting shirt.....E. Curran  
Pen. Fountain or reservoir.....E. L. Blake et al  
Pencil sharpener.....R. C. Uecke  
Pianos and automatic piano players. Position  
guide and holder for.....F. C. White  
Picture frame.....J. R. Rountree  
Pigment. Producing pure white.....W. G. Waring  
Pin.....R. Reibetanz  
Pipe. Apparatus for manufacturing composite  
Pipe. Appliance for balancing end pressure in  
lengths of.....R. F. Sproule  
Pipe flange or coupling.....G. C. Ribber  
Pipe mold making machine.....J. Ingham et al  
Placket fastener and skirt supporter.....J. E. Franzen  
Planimeter.....L. T. Snow  
Plant protector.....J. R. Eastering  
Planter. Potato.....J. Q. Adams  
Plow. Double row listing.....D. A. Biebing  
Powder. Apparatus for evaporating solvents  
from smokeless.....P. F. A. Liedbeck  
Precious metals from mattes containing them.  
Recovering.....F. R. Carpenter  
Precious metals from ores. Separating.....F. R. Carpenter  
Precious metals from their ores. Separating.....F. R. Carpenter  
Printing device.....M. J. Bulger  
Printing Multicolor.....E. T. Neben  
Printing plate holder.....R. W. Pittman et al  
Prismatic effects. Apparatus for producing.....W. H. Meagher  
Propelling mechanism. Boat.....D. C. Putnam  
Propelling mechanism. Boat.....D. R. Sheen  
Pulp screening machine.....W. H. Crosby  
Pump. Centrifugal.....W. Wenzel  
Pump controller. Electric motor driven.....T. Trolsen  
Pump or filling device.....E. Quick  
Pump. Reciprocating.....F. Lamplough  
Pump rod coupling.....A. E. Boring  
Punch. Self centering.....B. H. & G. A. Clement  
Puzzle.....T. J. Deck  
Puzzle. Picture.....I. H. Blanchard  
Rail joint.....J. E. Jones  
Rail joint.....W. E. Penn  
Rails. Appliance for cutting off the upper or  
wearing portions of compound tramway.....W. L. Le Maitre et al  
Railway crossing.....V. Angerer  
Railway. Electric.....2 pats. F. M. Ashley  
Railway gate and signal. Automatic.....H. Higgin  
Railway gate. Automatic.....A. Kammerich  
Railway rails. Boltless fish and bed plate for.....W. R. Crawford  
Railway road bed.....J. W. Cooper  
Railway signal.....J. B. Monroe et al  
Railway signal.....C. H. Remington  
Railway structure. Elevated.....C. Zimmermann  
Railway switch. Automatic.....W. R. & C. M. Murphy  
Railway. Street.....G. T. Osborn  
Railway system. Electric.....G. T. Woods  
Railway tie. Steel.....E. M. Denny et al  
Railway. Traction.....W. O. Gunkel  
Railways. Conductor, conduit, and collector  
for electricity on.....R. C. Sayer  
Railways. Electric signal system for.....J. W. Williams  
Razor strop.....E. Tennis  
Register.....I. S. Dement  
Registering mechanism.....W. L. Dixon  
Rein guide.....N. Johnston  
Respirator.....H. E. Jones  
Retinoscope.....W. H. Reisner  
Reversible motor.....V. L. Ochoa  
Revolving rake.....C. F. McKenzie  
Riveting machine.....G. E. Martin  
Rods, tubes, or pipes. Machine for cleaning  
and polishing the outer surfaces of.....T. B. Van Auker  
Rolling mill rolls. Means for greasing the  
necks or journals of.....R. R. & T. W. Jones  
Rolling mill. Seamless tubing.....J. H. King et al  
Roof fastener. Slate.....F. C. Sueden  
Rotary engine.....M. P. Elgen  
Rotary steam engine.....J. A. Jenkins et al  
Rug attachment.....M. C. Long

Rule attachment.....M. G. Bailey  
Sad iron.....A. J. Campbell  
Safety hook for suspending drapery for analogous  
purposes.....M. E. Higgins  
Sash lock.....C. A. Goodsell  
Sash lock.....L. Patterson  
Sawing machine.....R. C. Gossett  
Scaffold bracket.....M. S. Smith  
Screen cleaner.....I. Wiebe  
Screw cutting die.....H. J. Hjorth  
Secondary battery.....J. W. Madigin  
Sewer inlet or basin cover.....M. W. Petters  
Sewing machine. Broom.....W. C. Lipe  
Sewing machine. Buttonhole.....J. E. Dimond  
Sewing machine clutch mechanism. Button-  
hole.....W. W. Dixon  
Sewing machine marking attachment.....M. A. Bloomfield et al  
Sewing machine. Shoe.....A. B. Fowler  
Shade roller. Spring.....F. M. Vickery  
Shade rollers. Mounting for vertically adjust-  
able.....W. Scott et al  
Sheet and roller. Combined.....D. H. Haywood  
Shelving.....F. A. Phelps, Jr  
Shingle. Roofing.....W. C. & J. C. Shaip  
Signaling and collision preventing device.  
Electromechanical automatic.....C. S. L. Baker  
Silver bromide gelatin and making same.....A. Cobenzl  
Skate ankle support.....I. B. Macomber  
Skid. Portable.....J. Williams et al  
Skirt and waist holder.....M. Distelman  
Skirt supporter.....K. M. Dickerson et al  
Smoke in furnaces. Preventing.....J. Wilson et al  
Snap switch.....G. A. Mead  
Soldering caps on cans. Machine for.....W. W. Lawder  
Spindle and bearing.....G. Hill  
Spinning machinery. Mule.....I. Briggs, Jr  
Spout. Vessel ventilating.....A. A. Low et al  
Spring end plate.....J. Carroll  
Stacker. Pneumatic.....T. W. Slutz  
Stamp. Hand.....B. B. Hill  
Stave setter.....J. W. Jones  
Steam or water. Apparatus for controlling the  
passage of.....E. M. Eden  
Sull. Turpentine.....F. M. Gideon  
Store, library, office, or warehouse apparatus.....N. O. Starks  
Stovepipe fastener.....M. H. Goodwin  
Stove. Portable knockdown or folding camp.....F. Bach, Jr et al  
Strainer. Culinary.....M. B. Goodrich  
Subirrigating device.....C. M. Patterson  
Surgical splint.....W. H. Graham  
Suspenders.....W. H. Johnson et al  
Suspenders and belt. Convertible.....D. Lauferty et al  
Switch.....A. F. Sweigart  
Switch and protecting device. Combined.....H. H. Hornsby et al  
Switch operating device.....J. P. Lowe  
Switch stand.....M. W. Hibbard  
Syringe. Fountain.....J. Hardman, Jr  
Talking machine horn elbow.....W. Barnes  
Talking machine horn support.....W. Barnes  
Tally device.....L. L. Frost  
Tap. Bottle.....J. A. Sherrard  
Telegraph repeater. Wireless.....H. Shoemaker  
Telegraph system.....E. K. Storms  
Telegraph. Visible signal.....W. A. Farrell  
Telegraphy. Wireless. Reissue H. Shoemaker  
Telephone.....M. R. Hutchison  
Telephone coil box.....W. E. McCormick  
Telephone jack.....H. P. Clausen  
Telephone mouthpiece attachment.....J. F. Logue  
Telephone signal bell. Polarized.....E. E. Yaxley  
Telephone system.....I. H. Parsons et al  
Telephone system. Intercommunication.....T. Sloper et al  
Telephone transmitter.....C. C. Cadden  
Tension device.....T. C. Orndorff  
Ticket holder. Duplex.....H. Tyler  
Tile or brick cutting machine.....J. Bensing  
Tiles, bricks, panels, &c. Manufacture of.....T. Pfister  
Tire heater. Hydrocarbon.....W. W. Davis  
Tire setting apparatus. Rubber.....F. A. Orcutt  
Tire. Vehicle cellular rubber.....A. Ducasble  
Tobacco leaves. Machine for sizing or as-  
sorting.....W. Hunt  
Tool.....W. H. Soley  
Tool or implement.....C. W. Shedd  
Toy wagon.....W. Christensen  
Tripod adjusting head.....W. H. Fliehmann  
Trousers.....S. A. Myers  
Truck. Car.....J. Player et al  
Truck for tram cars or other rolling stock.....J. W. Wainwright  
Truss. Abdominal.....H. W. Fell  
Truss pad.....W. C. Wetmore  
Truss pad. Hernial.....D. Brisky  
Tunnel construction. Subaqueous.....T. K. Thomson  
Typewriter. Shifting keyboard.....A. C. Ferguson  
Typewriting machine.....A. C. Schuman  
Typewriting machine.....P. F. Nilson  
Valve. Explosive engine starting.....H. M. McCall  
Valve. Flushing.....L. B. Smith  
Valve. Gas engine.....E. E. Arnold  
Valve motions of different constructions  
Mechanism illustrating steam engine.....H. F. Colvin  
Valve. Throttle.....H. H. Vaughan  
Varnish or color cup.....R. L. S. Doggett  
Vault. Burial.....A. J. Bright  
Vehicle. Motor.....C. Crompton  
Vehicle. Motor.....O. H. Schildback  
Vehicle. Motor.....W. Norris  
Vehicle. Motor.....W. E. Whitbread  
Vehicle. Motor.....L. T. Bassett  
Vehicle reflector attachment.....H. P. Brown  
Vehicle running gear.....A. S. Baldwin  
Vehicle running gear.....R. D'Unger  
Vehicle steering apparatus.....H. J. Elsner  
Vehicle storm apron.....A. D. Bayles  
Vehicle wheel.....L. J. Cook  
Vehicle wheel.....B. Jones  
Vehicle wheel. Road.....G. S. Ogilvie  
Vehicles. Means for locking the steering  
mechanism of motor.....E. Devlin  
Vehicle. Speed regulating and controlling  
mechanism for self propelled.....A. W. Sandell  
Vehicles with air tires. Supporting shoe for.....L. Combrun  
Ventilating and chimney cowl.....A. Ashworth  
Vise.....E. E. Hanna  
Washers. Machine for making spiral.....J. E. Wilson

Wall or ceiling. Reflective.....L. Barteistone  
Watch protector.....D. Summa  
Water closet bend or pipe connection.....E. & A. Fleming  
Water lifting device.....J. W. Beck  
Water motor. Oscillating.....L. R. Phillips  
Water. Purifying.....W. M. Jewell  
Water purifying apparatus.....H. M. Livor  
Waterproofing textile fabrics. Apparatus for.....F. Rushworth  
Weeder.....J. H. Baker  
Weeder tooth.....L. D. Austin  
Weeding implement.....R. Hoodless  
Weighing machine.....G. A. Moore  
Well drilling machine.....H. H. Everhard  
Wells and screen.....S. Jackson et al  
Whiffletree.....C. Highers  
Window.....F. Voigtman et al  
Window ventilator.....N. M. Miller  
Wire pay out reel.....J. P. Delphey  
Wool scouring mechanism.....F. L. Whitney  
Wort and producing same. Concentrated hopped.....H. A. Hobson  
Wrench or spanner.....J. H. Morgan  
Zinc. Extracting.....W. G. Waring  
Zinc from its oxides, &c. Reducing.....W. Schulte  
Zither tailpiece and bridge.....F. Reinhard

## DESIGNS.

Badge.....J. A. Caron  
Bedstead head or foot section.....C. S. Boll

Issued January 20, 1903.

## MECHANICAL PATENTS.

Accumulator plate.....W. Kraushaar  
Aerator. Milk.....J. Lemire  
Ammunition. Apparatus for handling.....L. H. Everhart  
Automatic brake.....C. L. Taylor  
Band cutter and feeder.....R. Shedenhelm  
Bank money.....O. Burns  
Battery connection.....W. W. Keistead  
B.dstead. Invalid.....S. W. Bennett  
Bee smoker.....T. F. Bingham  
Beer cooler.....J. D. Hendrix  
Bicycle handle bar.....J. W. Leavitt  
Blast furnace.....L. Bentley  
Blower. Pressure.....V. W. Case  
Boiler flue. Detachable.....J. F. Drake  
Book casing. Metal.....M. J. A. Deydier  
Book index leaf.....H. J. Browne  
Book. Manifold.....E. B. Williams  
Boot or shoe cleaner.....D. McEachern  
Boring machine. Deep.....V. Petit  
Boring tool. Deep.....F. Buschmann  
Bottle dropping mouthpiece.....W. L. Strauss  
Bottles, &c. Machine for filling.....R. W. Huss  
Box or case.....B. L. Gale  
Boxes, &c. Implement for opening.....N. Savaria  
Brake and friction operating mechanism.  
Combined.....H. N. Covell  
Brake beam.....J. H. Baker  
Bread cutter.....A. Anderson  
Brick kiln.....J. H. Park  
Brooder.....M. M. Johnson  
Buckle. Clamp.....C. B. Granger  
Buckle. Harness.....W. Houghton  
Can body machine.....C. B. McDonald  
Car coupling.....E. O. Evans  
Car coupling.....J. Timms  
Car door or slide. Railway.....L. Daniel  
Car draft gear.....S. F. Klohs  
Car fender.....C. A. Taylor  
Car switching.....J. E. Swanson  
Carbonating device.....G. C. Wiedenmayer  
Card. Playing.....V. R. Cox  
Carriage spring.....T. B. Dowles  
Casement.....A. R. Huskisson  
Cattle guard.....C. J. Richardson  
Cement. Making.....H. E. Rusager  
Chain making apparatus.....J. H. Baker  
Chains. Manufacture of.....J. H. Baker  
Cheese cutter.....E. Z. & Z. H. Crowell  
Churn.....D. O. Kneeland  
Churn.....C. W. Van Deursen  
Cigarette making machine.....L. B. Baron  
Clamp.....W. S. Graham  
Clock. Electric.....W. J. Dudley  
Cloth piler.....W. O. Crain et al  
Coat and hat hanger.....C. Schlicker  
Coat rack. Automatic.....A. J. Battle  
Coffin.....R. E. Van Patten  
Coke oven lorry.....C. W. Umholtz  
Collar holder.....O. S. Lucas  
Compass. Beam.....J. F. Ellsworth  
Concrete mixing and measuring machine.....W. H. Brown  
Condenser.....F. Lamplough  
Conveyer.....W. E. Winant  
Conveying and loading crops or merchandise.  
Machine for.....R. Scott  
Cooker. Steam.....W. S. Hunt  
Copying bath. Letter.....R. Spurgin  
Core bar. Contractible.....C. E. Crosby et al  
Corn husker and fodder shredder.....I. G. Berry  
Corset attachment.....E. Bell  
Cotton gin.....P. F. King  
Crane. Overhead traveling.....C. L. Taylor  
Crate. Egg.....W. O. Anderson  
Cream separator.....M. Johnsrud  
Cross tie and clamp. Metallic.....J. Ottoman  
Cultivator.....A. B. Marsh  
Cultivator.....W. S. Neal  
Cuspator.....T. O. Kirk  
Cuspator.....S. L. Feathers  
Cuspator.....W. R. McClanahan et al  
Cycle saddle.....J. A. Kruseman  
Dental napkin holder.....H. A. King  
Derrick.....E. P. Arneau  
Derrick cableway.....G. H. Evans  
Desk.....J. A. Hodges  
Disk drill.....S. E. Davis  
Display cabinet.....C. V. Findley  
Door lock. Portable.....A. W. Swanburg  
Draft rigging.....G. W. Friesz  
Dredge. Electric clam.....E. Chaquette  
Drill and boring machine. Horizontal spindle  
.....G. H. Smith  
Drilling and boring machine. Adjustable at-  
tachment for horizontal spindle.....G. H. Smith  
Dust pan.....G. A. McIntire  
Dyeing raw stock.....W. J. McConville  
Ear ornament.....A. A. Geiger et al  
Electric cut-out. Thermal.....T. E. Scantlin  
Electric furnace.....E. G. Acheson  
Electric motors. Controlling.....W. H. Chapman



Electrical switch, Quick break. F. A. La Roche  
Electrotherapeutic apparatus. W. H. Ames et al  
Elevator leg. L. Burmeister  
Elliptic spring. T. A. Shea  
End gate lock. F. M. Oakes  
End gate, Wagon. F. G. Nagley  
Evaporator, Brine. D. W. Miller  
Excavating machine. D. W. Miller  
Exhibiting curtains for sale. Device for. H. Hay  
Explosive engine. H. J. Hurd  
Fare register. J. F. Ohmer  
Fare registers. Means for operating. J. F. Ohmer  
Fare registers. Mechanism for operating. J. F. Ohmer et al  
Feed water heater. G. F. Conner  
Feeding regulator. Automatic. F. Woerner  
Fence gate. Wire. L. C. Lewison  
File and pocket attachment. Bill. G. H. Maurer  
Filter. Barrel. F. Stuer  
Filter. Barrel. B. Tully  
Filter. Centrifugal. G. Moore  
Finger guard. D. McMillan  
Fires, Protector from. M. Murry  
Flea trap. G. T. Godfrey  
Forced draft furnace. F. J. Maly  
Forming tool. W. C. Yeatman et al  
Fruit box. R. H. Shoemaker, Jr  
Furnace air heater. Smelting. J. L. Giroux  
Furniture, etc. Wrapper for. A. J. Bunnell  
Fuse or junction box. Electrical. M. H. Johnson  
Fuse. Safety. J. Sachs  
Game apparatus. R. W. Harris et al  
Game apparatus. F. P. de Grandchamp  
Garment clasp. C. H. Reimard  
Gas distributing apparatus. W. H. Wigmore  
Gas engine. P. Robertson et al  
Gas generator. Acetylene. T. H. J. Leckband  
Gas, Making. B. Talbot  
Gas meter. H. C. Dick et al  
Gas, Producing. J. F. Stacey  
Gas regulating valve. T. Wilson  
Gas valve and burner. Combined. E. L. Moore  
Gate. J. H. Hodgins  
Glass, Decorating art. S. Aike et al  
Glass, Manufacturing art. S. Aike et al  
Goal. D. Foulis  
Gold extracting process. T. B. Joseph  
Gopher trap. J. M. Merritt  
Grain separator seed cleaner. L. Thortved  
Grate. Domestic fire. J. J. Chavasse  
Grate, Foldable. C. A. Larson  
Gun field mount. Automatic machine. L. V. Benet  
Gun recoil apparatus. A. T. Dawson et al  
Gun. Spring air. W. F. Markham  
Handle for sheet metal vessels. L. Reaser  
Harrow riding attachment. J. Mangan  
Harvester. Shock corn. G. T. Crobarger  
Heater. J. G. Hastings  
Heating or cooling apparatus. A. Hammond et al  
Heating system. Electric. E. E. Gold  
Hoof trimmer. S. I. Rose  
Hopper. Loading and discharging. T. Nicholson  
Horn, &c. Manufacture of meal from raw. J. G. Bierich  
Horse receptacle. G. W. Cooper  
Hose reel for cranes. H. H. Sullings  
Hydrocarbon vapor burner. L. Tapin  
Ice tongs. G. L. Pervier  
Index. Card. R. L. Hunter  
Induction motor. C. C. Chesney  
Irrigator. E. E. Steude  
Knee rest. I. Petterseu  
Knitting machine. F. M. Nichols  
Lamp guard and shade. Combined. W. J. Hartwig  
Land roller. O. A. Packer  
Last. E. Bostock, Jr  
Lasting machine. Boot or shoe. R. W. Peer  
Latch. A. Williams  
Leaf spring. T. A. Shea  
Leather splitting machine. W. D. Quigley et al  
Lifting jack. H. Dearborn  
Linotype machine. C. Muehleisen  
Liquid fuel burner. D. H. Mosteller  
Liquid separator. Centrifugal. O. Ohlsson  
Locomotive exhaust mechanism. I. F. Wallace et al  
Loom cloth roll shaft. R. R. Kelly  
Loom thread parting mechanism. E. S. Stimpson  
Mail delivering apparatus. G. Condory  
Mail receiving and collecting apparatus. F. Marx et al  
Massage apparatus. C. J. Bailey  
Massaging apparatus. F. B. Turk  
Massage machine. T. D. Ingram  
Mattress tufting machine. F. Benoit  
Medicine dropper. G. B. Hutchings  
Metal treating furnace. H. D. Hibbard  
Metallic oxides. Reducing. E. G. Acheson  
Milling machine change speed attachment. W. P. Norton  
Molding machinery. W. W. Doolittle  
Muller. W. Schuerer  
Nail. E. H. McKay  
Nut lock. M. F. Wenrich  
Nut lock. E. Levy et al  
Nut lock. E. S. Hawkins  
Nut lock and guard. A. E. White  
Ordnance. Extractor for breech loading. J. F. Meigs et al  
Packing. G. M. Costello  
Packing device. Hydraulic. A. G. Cummings  
Packing rings. Machine for making. A. B. Norris  
Padlock. W. K. Palmer  
Painter's hook. B. F. Foss  
Paints. Cabinet for exhibiting and advertising. H. W. Shaw  
Paper cutter. M. Nelson  
Parer and coring machine. Fruit. L. I. Yeomans  
Pedometer. W. E. Porter  
Pen guide or rest. I. Bergmann  
Photographic plate and film bath tank. S. A. Boucher  
Photographic shutter operating mechanism. G. A. Sommer  
Piano tuner. A. Brambach  
Pick. W. S. Jenkins  
Picture exhibiting device. A. Hoemle  
Piercing and expanding mill. J. H. Nicholson  
Pipe truing mechanism. W. W. Doolittle

Placket closer. E. Falkenberg  
Plane. J. A. Traut  
Planing key grooves. Machine for. F. Regner  
Plow and planter. Combined lister. 2 pats. A. Shearer  
Plow. Beet pulling and lifting. W. H. Gilbert  
Plow. Riding. J. Ehler  
Plow. Wheel. C. T. Elliston  
Pneumatic tube system. K. E. Stuart  
Pole and thrill coupling. J. E. Ackerman  
Pole or post anchor. Metallic. W. W. Hill  
Potato dropper. C. R. Foard  
Precious metals from matte. Separating. F. R. Carpenter  
Pressure exerting mechanism. E. Guenther  
Printers' rules. Machine for mitering. H. C. Hansen  
Printing in colors. Apparatus for. T. Regensteiner  
Printing plates. Making relief effect. W. A. Hinners  
Printing plates. Making relief effect. J. L. Shilling  
Printing press chase holding device. R. E. & A. Kemper  
Propeller wheel. O. E. Sarr  
Pulley. Expansible. P. H. Shue  
Pump. Centrifugal. L. Leblanc  
Pump. Force. W. A. Kerfoot  
Pumping engine. Non rotative. L. d'Auria  
Punch. Check. W. J. Kenderdine  
Puzzle. E. Hocker  
Paroxylin compound. J. H. Stevens  
Radiator. A. G. Bayles  
Railway block system. H. J. Fuller  
Railway switch. P. F. King  
Razor wiper. Antiseptic. R. B. Dakin  
Receptacle for liquid or semiliquid substances. J. Hinkel  
Refrigerating apparatus. R. Coppola  
Refrigerator. W. A. Hulin  
Refrigerator. S. Jones  
Refrigerator. H. Inman  
Refrigerator car. G. C. Perkins  
Respirator. J. W. McNary  
Riding habit. J. Juran  
Roof bracket. J. L. Chase  
Rotary engine. J. L. McMillan  
Rotary engine. J. B. Pollard  
Rotary engine. Multiple expansion. H. Pearce et al  
Safes, &c. Closing and locking device for. W. H. Reynolds et al  
Sales pad. H. W. Mather  
Scoop. A. H. Baughman  
Sculptural reliefs, &c. Making. J. Walter  
Sealing jar for preserving articles of food. G. Lees  
Secondary battery. I. Kitsee  
Seed drill scraper. Disk. W. Stephenson  
Seed dropper and fertilizer distributor. Cotton. J. C. Griffin  
Seeding machine. F. K. Lathrop  
Sewed articles. Seam for. C. McNeil  
Sewed articles. Seam for. E. T. Allan  
Sewed articles. Seam for. R. G. Woodward  
Sewing machine guide. M. E. Campbell  
Sewing machine take up mechanism. J. Diehl  
Shade stop and release. Automatic window. H. A. Starr  
Shades to rollers. Means for fastening. H. A. Starr  
Shaft collar. Split. G. Potstada  
Sharpening. Disk. A. H. Grimm  
Sheets or plates. Machine for making laminated. E. Cooper  
Shingling bracket. J. W. Farr  
Shuttle. Weaver's. L. Wengelfeld  
Sink and wash and bath tub. Combined. T. Mills  
Slack adjuster. W. H. Savage  
Slotting machine. P. B. Harrison  
Smelting furnace. F. B. Pettengill et al  
Smoke consuming boiler furnace. W. H. Daniels  
Speaking tube mouthpiece. J. C. Bahr  
Speed changing device. J. H. & H. H. Dow  
Spoke fastening device. J. Gaworzewski  
Square and miter. Try. S. A. Caldwell et al  
Square. Protracting. S. A. Caldwell et al  
Stacker. Hay. J. M. Copenhaver  
Stacker. Hay. C. B. Rhoads et al  
Stair cover and nosing. W. H. Cooper  
Stall. Collapsible horse. A. Herschmann  
Stand pipe. M. M. Moore  
Staple. W. H. Morehouse  
Steam boiler. E. T. Hannam  
Steam boiler for motor vehicles. A. D. Smith  
Steam engine. C. Lean  
Steam generating furnace. J. L. Giroux  
Steam generator. E. A. Briner  
Steam separator. I. Watts  
Store bin. C. H. Mather  
Stove grate. A. B. Clunies  
Stove or range gas heating apparatus. Cooking. T. I. Rankin  
Stovepipe. O. M. Bubb  
Sugar from beets. Making. E. Breyer  
Support or trestle. Folding. A. Burri et al  
Supporting apparatus. Safety. J. K. Green  
Suspender fastener. H. Joslin  
Swing. C. B. McKay  
Tarp hole plugs. Making. A. Dicky  
Target. Shooting gallery. 2 pats. A. J. Northcraft  
Telephone set. K. B. Miller  
Telephone system. F. B. Wood  
Thill support. Autirattler. J. B. Cooke  
Thread guide and cleaner. F. E. Garner  
Time lock. C. W. Spicer  
Tin from tin scrap. Recovering. R. H. Gould  
Tire. Elastic wheel. W. C. Lilly  
Tire. Vehicle. J. S. Ghenhalls  
Tobacco knife. G. H. Kelley  
Toilet tablets. Apparatus for making. W. Kropff  
Tooth crown. Artificial. H. Friedland  
Torch. C. H. Brown  
Toy. J. H. Nelson  
Toy figure. C. E. Shaffer  
Traction apparatus. N. Hiss  
Trap trigger toboggan. H. H. Dreyer  
Trolley. G. R. Tomb  
Trousers. Means for creasing. A. S. Pike  
Trousers support. M. M. Bowman  
Truck. Car. S. F. Klohs  
Tube drawing device. R. C. Stiefel et al  
Turbine. Steam. R. Schulz  
Turbine. Steam. L. E. Crespin  
Tweezers and magnifying glass. Combined.

Twisting and winding machine stop motion. F. J. Boehm  
Type holding clamp. H. & J. W. Collins  
Type holding clamp. J. A. Haadiboer  
Typewriter ribbon actuating mechanism. J. D. Daugherty  
Typewriter machine. J. S. Harrison et al  
Typewriter machine. Electrically operated. J. H. Harrison  
Valve. Air inlet. H. S. Renton  
Valve. Fluid pressure regulating. J. L. Chapman  
Valve for air brakes. Triple N. A. Christensen  
Vehicle brake. Automatic. J. A. Beyer  
Vehicle with electromotive power. O. Lasche  
Vending machine. F. E. Huxley  
Veneering. Wall or ceiling. R. P. Andersen  
Vent and indicator for storage casks. Self-closing. J. G. F. Hieber  
Ventilating brick buildings. Means for. T. Darlington  
Wagon. L. K. Davis  
Washing machine. W. G. Gibbins  
Watchcase centers, &c. Machine for making. C. H. Field  
Water heater and washing machine. Combined. B. Lungren  
Water purifier. J. Johnson  
Water tower and fire escape. Portable. H. H. Gorter  
Watering pool. Stock. B. F. Hudson  
Weather strip. E. Gauron  
Well boring apparatus gripping device. H. G. Johnston  
Wheels and pulleys. Manufacture of. A. Theyskens  
Windmill mechanism. J. M. Smith  
Window. P. Bertges  
Wire articles. Machine for making. G. W. Whittington  
Wood stopper. S. Ruffin  
Work box. J. Watson  
Wrapping machine. A. Beinauer  
Wrapping pamphlets, &c. Machine for. E. P. Sheldon  
Wrench. J. Pederson et al  
Yarn drying and conditioning apparatus. J. Keith et al  
Zither. W. H. Banks

## DESIGNS.

Book cover. W. M. Rhoads  
Cabinet. C. Ruppel  
Chandelier. H. E. Watkins  
Plate or similar article. C. A. May

Issued January 27, 1902.

## MECHANICAL PATENTS.

Agricultural implement. W. C. Allen  
Air compressor. W. M. Myers  
Amalgamator. Ore. J. E. Sutphen  
Angle brace. Extensible or extension. J. H. Rusby  
Applicator. H. A. Bierley et al  
Asphalt cutting attachment for steam rollers. J. Richards  
Axle washer. Vehicle. W. C. Folant  
Bag holder for bagging grain. E. M. Gilbert  
Baling press. J. S. Tuttle  
Ball and socket joint for dolls, &c. E. Debes  
Ballot box. W. L. Cornelius  
Basket. M. P. Kilian  
Bed coupling. Iron. G. W. Comee  
Bedstead attachment. J. A. Martin  
Bedstead. Folding. A. Allendy  
Belt shipping device. G. W. Ruth  
Bicycle brake. Coaster. J. Hurch  
Binder. Temporary. E. A. Trussell  
Blind. C. M. Smith et al  
Boats. Ventilation of submarine. S. Lake  
Bobbin holder. W. Fielding  
Body brace. W. B. Dewees  
Boiler. A. Jaeger  
Boiler scale. Compound for removing steam. J. N. Henderson  
Bolster spring. N. Halvorsen  
Book holder. H. B. Smith, Sr  
Book holder bracket. Adjustable swivel swing. W. J. Walsh  
Bottle closing head or stopper. G. G. Campbell  
Breast supporter. P. D. Beeman  
Bridge. Rolling lift. S. T. Smetters  
Briquet. W. J. Roussel  
Brush. C. E. Graham  
Brush. J. Johnson  
Brush. Fountain. J. F. Spence  
Brush. Hair. G. N. Holland  
Bucket dumping apparatus. W. R. Wilcox  
Buggy top. E. A. Rhinesmith  
Buildings, &c. Material for the construction of. L. Millet  
Bulk head doors. Means for operating. A. Du Bois Raymond  
Button. Spring. J. Wetzler  
Buttoner. Collar. W. D. Paterson  
Cabinet. Machine bearing. T. Kundtz  
Car salting machine. W. E. Dement  
Candy making machine. J. Friend et al  
Canopy support. W. J. Snyder  
Car brake mechanism. J. Shelton  
Car coupling gravity pin lifter. W. B. Dievendorf  
Car. Derrick. J. A. McManus  
Car. Dumping. J. A. McManus  
Car fender. J. Quern  
Car heating system and steam trap therefor. W. H. Pearce  
Car. Passenger or baggage. F. Parsons  
Car replacing frog. H. C. Harrar  
Car sign. Electric. I. B. Brower  
Car switching mechanism. T. A. Ennis  
Car wheel and track therefor. T. W. Kester  
Cars. Device for decreasing noise resulting from vibration in railway. H. G. Farr  
Carpet strip cutting machine. W. B. Cobb  
Casket trimmings. Machine for embossing. H. T. Loomis  
Chaplet and shrine of the holy rosary. T. Sault  
Check for hotels, restaurants, &c. Control and guest's pay. M. Geller  
Cherry seeder. E. D. Parker  
Chock block. R. T. Wilson  
Churn motor. G. W. Stiles  
Cigar box. M. P. Farrell et al  
Cigar cutter. E. A. Willard  
Cigar machines. Pneumatic transferring mechanism for. O. Tyberg  
Cigar perforator. F. M. Siocum

Clothes drier. Foldable. J. K. Champ  
Clutch. Friction. C. E. Ellicott et al  
Coal elevator. Self-dumping. D. W. Jones  
Cock lock. Gas. F. S. Martin  
Compass or scriber. H. E. Seymour  
Compressor and valve for same. E. Reynolds et al  
Concentrating table. A. R. Wilfley  
Concentrating table slimer attachment. C. T. Arkins  
Contact structure. Surface. E. M. Hewlett  
Conveyer. R. Blum  
Cooler. F. Guttenberg  
Copper ores. Treating. W. Payne et al  
Cotton press. E. D. Carter  
Cultivator. A. Psota  
Cultivator arch bar. C. M. Sullins  
Current traction system. Alternate. W. M. Mordey  
Curtain or portiere holder. A. M. Brush  
Curtain pole bracket. C. H. F. Dailg  
Cushion spring. Upholstered. E. B. Smith  
Cutter head. E. S. Shimer  
Cyanids and acetone. Making. C. B. Jacobs  
Dental disk holder. E. J. Douhet  
Desk. School. J. Karpen  
Digester linings. Composition for. E. Heutschel  
Disinfectant vaporizer. S. Trenner  
Disinfecting device. L. E. Jones  
Display cabinet. Ribbon. N. Lafon  
Display holder. R. H. Walk  
Display rack. A. V. Thomas  
Distilling apparatus. Water. J. Ellison  
Ditching machine. J. H. Sylvestersen  
Doubling and rewinding machinery. J. D. Conant  
Dough divider. F. H. Van Houten  
Dough dividing and shaping machine. H. F. W. Hueg  
Dough mixing apparatus. H. B. Wilson  
Drainage conveyor trough. F. G. Wolfe  
Dress shield fastener. C. O. Pettersson  
Drying closet. M. A. O'Connor  
Dye and making same. Yellow azo. 2 pats. F. Runkel  
Eccentric. J. Pincin  
Electric circuit controller. Automatic. H. W. Leonard  
Electric socket. A. P. Seymour  
Electric switch. Automatic. W. Lasar  
Electric time switch. J. J. Stockall, Jr  
Elevator. N. Hiss  
Elevator gate. C. Anderson  
End gate. J. E. Gibbs  
Engine. H. F. Shaw  
Engine cooling means. Explosive. H. Gross  
Engines. Combined regulator and safety mechanism for explosive. L. G. Woolley  
Engines. Spark igniting mechanism for explosive. C. G. Annesley  
Excavating machine. C. N. Alderman  
Exhibitor. G. W. Freese  
Explosive engine. B. Niles  
Farm gate. J. J. Sigafos  
Fats. Purifying. I. Kimont  
Faucet. Measuring. J. Sjostrom  
Feed box. Poultry. G. C. Sproat  
Feed water heater. H. G. Keasbey  
Fence or gate. A. W. Knittel  
Fender. J. McGuire  
Fiber vessels. Machine for making. E. Hubbard  
File. Letter. W. Macgowan  
Filter. R. W. Davis  
Finger pad. J. G. Marsh  
Firearm trigger mechanism. E. M. Liebert  
Fire escape ladder. L. G. Pettis  
Fire extinguisher. H. A. Bierley  
Fire extinguisher acid holder. J. L. Williams  
Fire raking apparatus. J. C. McDonald  
Fish cleaning apparatus. J. Johnson  
Floor and ceiling construction. 3 pats. J. Schratwieser  
Floor clamp. W. Hoekstra  
Floors and ceilings for buildings. Construction of. J. C. Pelton  
Flour tank and sifter. Combined. R. N. Holmes  
Flue thimble. Adjustable. C. J. Kirch  
Fluid pressure operated device. B. M. W. Hanson  
Folding chair. E. T. Zimmerman  
Forming machine. B. W. Coghill  
Fuel feeding apparatus. L. K. Davis  
Furnace. S. P. Smith  
Furnace charging machine gripping device. S. T. & C. H. Wellman  
Furnace draft regulating apparatus. G. B. Tyler  
Furnaces. Introducing carbon, fluxes, &c., into blast. W. J. Foster  
Fuse or cut out. Electric. 2 pats. H. L. Morse  
Fusible plug. H. D. Morton  
Galley. P. J. Cooney  
Game apparatus. J. A. De Lon  
Game apparatus. A. C. Schneider  
Garment hanger. F. Pratz  
Garment support. C. Rabenowitz  
Garment supporter. W. S. Radnedge  
Garment supporting device. G. C. Sleeth  
Gas burner attachment. J. M. O'Kelly  
Gas generator. Acetylene. A. Davis  
Gas generator. Acetylene. J. Choulet  
Gas generator. Acetylene. W. A. Robertson  
Gas generator. Acetylene. E. B. Stoner  
Gas meter support. T. B. Kinchla  
Gas process. O. Oppelt  
Gear mechanism. Transmission. R. B. Hain  
Gear. Reversing. H. Moon  
Gearing. Friction. Reissue. O. Marth  
Governor and throttle valve controlling mechanism. R. B. Hain  
Governor. Electromechanical. E. Gray  
Governor. Speed. R. Weber  
Grain drill. J. Steep  
Grinder frame. Folding. E. A. Johnston  
Grinding or sharpening machine. W. A. Van Berkel  
Grooving machine. A. V. Allen  
Gun. Magazine bolt. E. G. Parkhurst  
Hammer. Pneumatic. W. T. McCook  
Handling stored pulverized or granular materials. Apparatus for. E. H. Hurry et al  
Hat fastener. J. Uhry  
Hat smoothing apparatus. Silk. O. Hammerstein  
Heating engine. A. W. Case  
Heating furnace. R. T. Dressler  
Hides or skins. Machine for softening. H. Foisy



Hinge.....A. E. Preston  
Hoisting apparatus.....A. E. Norris  
Hoisting apparatus.....G. Blaauw  
Hoisting apparatus.....E. H. & V. R. Browning  
Hoof pad.....A. C. Tappe  
Hot air furnace.....W. H. Chappell  
Hub, Metal wheel, 2 pats.....E. R. Wagner  
Illuminating structure, 2 pats.....F. L. O. Wadsworth  
Implement, Pocket.....G. P. Coates  
Index.....R. C. Russell  
Injector burner.....E. B. Shaw et al  
Inkstand.....C. L. Smith  
Internal combustion engine.....C. E. Dawson  
Intestine cleaning apparatus.....H. Naegle  
Invalid supporting rest.....J. A. Blanchard  
Iron into steel or malleable iron and in the product so obtained. Converting cast.....J. A. Hunter  
Ironing machine.....E. G. Smith  
Jar holder, Fruit.....E. P. McGuire  
Key mechanism.....C. A. Lord  
Knife and fork.....G. Garda  
Knitting machine.....B. Salzer et al  
Knob fastening.....G. W. Roberts  
Lacing hooks in shoes. Machine for fastening.....H. H. Eaton  
Ladder.....W. C. Buell  
Ladder hook, Extension.....W. A. Burbridge et al  
Ladle car.....R. H. Stevens  
Lamp chimney lantern frame.....E. F. Weidig  
Lamp, Electric arc.....A. F. Shore  
Last.....A. G. Fitz  
Lathe, Wood turning.....B. S. Loveland  
Leg, Extensible telescopic.....W. A. & L. D. Schofield  
Leveling instrument.....J. A. Traut  
Life belt inflating device.....J. Ewing, Jr  
Linotype machine.....H. B. Bartlett  
Linotype machine and matrix therefor.....S. Smith  
Liquid purifying system.....J. J. Deery  
Litter.....J. A. Tabor  
Lock.....J. C. Christensen  
Locking bar.....J. P. Maginnis  
Locking system for jail doors.....D. F. Youngblood  
Log capper.....J. H. Dickinson  
Log loader.....W. S. Kennedy  
Loom harness frame.....H. W. Bracke  
Loom shedding mechanism.....H. Wyman  
Lubricating box.....T. A. Matthews  
Magneto electric machine.....J. M. Wilson  
Mantle, Self igniting.....R. E. Berthold  
Mashing apparatus.....O. Selg  
Match box holder.....W. Bernard  
Metal preserving and cleansing compound.....A. Beck  
Metals from ores, Extracting.....Z. B. Stuart  
Mine cage, Self dumping.....F. A. Ray  
Molding machine.....J. F. Nolan  
Mop and wringer, Combined.....C. S. Shych  
Mortising machine.....W. Black  
Mowing machine.....W. N. Whately  
Multiple expansion engine.....F. M. Prescott  
Music holder and leaf turner.....A. D. Crist  
Musical instrument, Electrical self playing.....G. H. Davis  
Nut cracker.....H. Budesheim  
Nut lock.....E. Staples  
Obstetrical sheet.....S. Faulkner  
Oil burner.....L. H. Lewars  
Order holder.....F. M. Turck  
Ore concentrator.....F. L. Bartlett  
Ore concentrator.....C. Brown  
Ore separator, Dry.....R. E. & E. Waugh  
Ore treating apparatus.....Z. B. Stuart  
Ores, Treating argillaceous and alkaline.....C. H. Gage  
Packaging powdered or granular materials, Machine for.....J. R. Okell  
Packing.....W. Reinhold  
Packing machine feed.....W. Rose  
Padlock.....C. R. Snyder  
Pan lifter, can opener, and corkscrew, Combined.....H. D. Gady  
Paper feeding machine.....G. R. Williams  
Photographic apparatus.....P. F. Cowing  
Photographic decoration, Vitrifiable.....L. Crabtree  
Photographic printing frame.....A. R. Selden  
Photographic shutter.....G. L. Coursen  
Piano action.....C. L. Kallstrom  
Piano, Electric self playing.....G. H. Davis  
Pie trimmer.....T. Reminger  
Pigment and making same.....W. J. Armbruster  
Pinwheel and star wheel motion.....J. T. Cyr  
Plane.....L. C. Clark  
Plane.....W. L. Scott  
Plane.....J. A. Traut  
Planter, Check row corn.....J. E. Bering  
Plow and planter, Combined lister.....G. E. Evans  
Polish, &c. Holder for.....H. Altshul  
Power transmitter.....W. McHaffie  
Press.....J. Dennis  
Press board.....C. Horyta  
Printing machine.....S. G. Goss  
Printing or coloring yarn or similar material.....W. J. Webb  
Printing or coloring yarn or similar material, Apparatus for.....W. J. Webb  
Propeller.....A. de Bausset  
Propeller, Reversible.....J. V. Johansson  
Purse or bag frames, Holding catch for.....C. Hering  
Rail joint, reissue.....H. B. Nichols et al  
Rail joint for street car tracks.....J. Jones  
Railway clamp and gage.....B. G. & J. Norris  
Railway crossing.....Z. Frei  
Railway, Electric.....M. T. A. Kubierschky  
Railway electric danger and safety signal.....H. F. Spurr, Jr  
Railway electric motor cooling system.....C. O. Mailloux et al  
Railway rail.....Z. I. Pierce  
Railway spike.....J. Pederson  
Railway switch.....M. S. Pittman  
Range finder.....A. Kennedy  
Razor.....H. Drosse  
Refrigerating apparatus.....A. J. Chase  
Refrigerator drip pan, Removable.....R. & G. Frey  
Rein holder.....S. S. Cornelius  
Relasting machine.....G. H. Bickley  
Rivet cutter.....W. Franz  
Riveting machine.....G. E. Martin  
Road scarifier.....W. M. Fawcett  
Rolling sheet and tin plate, Apparatus for.....C. W. Bray  
Rope tension attachment, Pneumatic balancing.....H. W. Rank

Rotary engine.....O. G. Rieske  
Rotary engine.....E. Ulland  
Rotary engine.....E. T. Cass  
Rotary engine.....L. J. Collins  
Rotary engine.....A. G. McPherson et al  
Rotary engine, Balanced.....F. P. Huyck  
Rotary gas engine.....O. G. Rieske  
Ruler.....T. Ramsay  
Rust preventing and removing composition.....S. T. Coffing  
Sand blast apparatus, Washer for.....A. G. Warren  
Sash operating mechanism, Window.....P. A. Houghtaling  
Sashes, Screen strip for window.....J. D. Campbell  
Sausage stuffing machine.....G. R. Napier  
Saw handle.....J. A. Williams  
Scaffold.....W. L. Clancy  
Screen.....J. D. Campbell  
Screw plate and die.....F. W. Conant  
Seed dropping mechanism.....A. C. Lindgren  
Separator.....A. Langerfeld  
Sewing machine.....A. E. Lindner  
Sewing machine feed actuating mechanism.....W. F. Dial et al  
Shade, Window.....P. G. Emery  
Shaft hanger, 2 pats.....H. T. Hollowell  
Shaping machine work table.....J. C. Potter et al  
Sheet delivery.....G. P. Fenner  
Sheet leader block.....W. H. Marshall  
Shock loader.....C. J. Stovin  
Shoe polisher.....J. W. Edgerton  
Single trigger mechanism.....L. Henry  
Skirt yoke.....A. Sullivan  
Slab for building construction.....M. Watson et al  
Slab or block for building purposes.....A. Mack  
Sled attachment.....E. C. Whitney  
Sleigh runner.....D. D. Grant  
Snow excluder.....L. L. Leathers  
Sock.....W. C. Hall  
Soda fountain.....J. B. Herron  
Sound box.....W. B. Outten  
Speed mechanism, Variable, 2 pats.....G. H. Follows  
Speed regulator, Generator.....G. J. & H. G. Pelstring  
Spinning machine separator.....A. D. Chandler  
Stacker, Pneumatic straw.....C. F. Dammeier  
Staking machine.....F. C. Kimball  
Statistics, Compiling.....C. F. Pidgin  
Steam boiler.....F. M. Kamsdell  
Steam trap.....I. S. McDougall  
Steel, Apparatus for use in the production of.....E. C. Wills  
Stirrup, Riding.....W. G. Murphy  
Stock.....R. V. D. Stoutenburgh  
Storage battery.....C. H. Everitt  
Storage structure.....C. Piez  
Stove.....E. A. Quisenberry  
Stove, Cooking.....J. T. Clancy  
Stove or furnace grate.....J. H. Goodfellow et al  
Structural metal support.....T. Collins  
Stubble shaver.....T. X. Landry  
Sugar from beets, Making white.....L. Hirt  
Sulfuric anhydrid, Apparatus for the manufacture of.....J. B. F. Herreshoff  
Sulfuric anhydrid, Making.....J. B. F. Herreshoff  
Suspenders.....I. Wechsler  
Swing.....G. S. Kerr  
Swing.....C. T. Campbell  
Swing, Lawn.....J. Plattenburg  
Switch closing mechanism, Safety.....D. J. Sullivan  
Switch controlling apparatus.....C. W. & J. B. Squires  
Syringe, Hypodermic.....M. Campbell  
Telegraph or telephone circuits, Line tapping device for.....C. Dietz  
Telegraphy, Electric.....A. Muirhead  
Telegraphy, Tuning device for wireless.....W. S. Hogg  
Telephone system.....W. Hohne  
Temperature retaining device.....J. Hommel  
Threshing machine band cutter and feeder.....W. T. Wright  
Tile, Making mosaic.....T. H. Mooney  
Tile, Roofing.....F. E. Coombs  
Timepiece gearing.....E. Kuhn  
Tire.....E. A. Arcouet  
Tire casing openings, Device for closing.....O. T. Semler  
Tire fastener, Vehicle.....J. C. Haines  
Tire Vehicle.....F. P. Brining  
Toaster.....C. J. Parker  
Tool and tool holder.....S. S. Swan  
Tool carriage mechanism.....B. M. W. Hanson  
Toothpick.....A. Lenhardtson  
Toy.....F. Dean  
Toy or trick device.....T. H. Murray  
Toy shooting gallery.....C. C. Reinhardt  
Toy, Spinning and dancing.....T. S. Thornburg  
Track laying and spike driving machine.....F. B. Hewett  
Triple expansion engine.....F. M. Prescott  
Trolley.....A. J. Johnson  
Trolley wire support.....E. Hill  
Trunk and dressing table, Combination.....M. Berry  
Tubing, Apparatus for manufacturing seamless.....J. H. King et al  
Turbine, Fluid pressure.....D. F. Asbury  
Turbine, Triple expansion fluid pressure.....D. F. Asbury  
Type, Clamp for pages of.....W. H. Francis  
Type setting machine keyboard.....C. Roazar  
Type writer.....C. S. Booth  
Type writer.....G. H. Lillie  
Type writing machine.....D. Briggs et al  
Type writing machine copy holder.....S. L. Engel  
Umbrella cover fastener.....W. J. Slyder  
Umbrella notch piece.....C. H. Schaeffer  
Universal joint.....F. E. Bocorseiski  
Valve, Dry.....J. K. S. Ray et al  
Vault, Burial.....H. E. Goodwin  
Vehicle and connections therefor, Trail.....F. L. Norton  
Vehicle body.....J. P. Johnson  
Vehicle for transportation of animal bodies.....W. Renger  
Vehicle steering mechanism, Motor.....H. Austin  
Vehicle wheel.....C. Miller  
Vehicles, Self starting chock for.....A. H. Minney  
Vessels and torpedoes from a distance, Appliance for electrically operating.....L. Wilson  
Vignetting tool.....F. J. M. Gerlaud  
Vise.....J. R. Long  
Washboard holder.....B. N. Merrill  
Washing machine.....G. V. Cesinger

Water closet.....G. W. Becker  
Water heater.....J. McCartney  
Water motor.....W. B. Alford  
Water of dams or reservoirs, Means for purifying the.....T. Lydon  
Water or sewage, Apparatus for the purification of.....J. N. McClintock  
Water purifier and heater.....J. C. Forbes et al  
Weather strip.....W. Savitz  
Weed cutting and soil stirring device.....H. D. Clayton  
Well cleaner, Oil.....R. H. Hoffman  
Well drill, Driven.....M. Ziegenfuss  
Well drilling apparatus, Pneumatic.....H. W. Rank  
Winding machine Thread.....T. Hansen  
Window frame and sash.....R. B. Browne  
Window, Roof ventilating.....W. Dreyer  
Window screen.....W. C. Hildebrand  
Wrapping machine.....S. J. Hicks  
Wrench.....J. L. Bovee

## DESIGNS.

Couch frame.....3 pats.....D. Pepper  
Divan frame.....7 pats.....D. Pepper  
Fabric.....2 pats.....W. A. O'Brien  
Lamp body.....C. W. Beck  
Spoons, forks, &c. Handle for.....W. C. Codman  
Stove.....S. Boal

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

Foreign patents may also be obtained in certain other countries.

**FREE!** Send us 2 cents to pay for postage and we will mail you a valuable copyrighted book, "How to obtain Patent, Caveat, Trade-Mark and Copyright Protection, with Decisions in Leading Patent Cases" entirely free of charge. Address: **INVENTIVE AGE PUBLISHING COMPANY, (Dept. P.) WASHINGTON, D. C.**

## Magic Rheumatic Cure!

It absolutely does cure. It is not a cheap remedy but it is a cheap cure. Mark the distinction! There are a thousand remedies to one cure. This is a CURE. It costs \$2.00 a bottle, and is worth \$20.00 to any sufferer. All good druggists sell it. If not, don't let them "stuff" something else on you. We will send prepaid for \$2.00. Book free. Agents wanted.

## MAGIC CURE CO.

R. 331-315 Dearborn St.

Chicago.

## Are you willing

to venture a quarter for a three months' trial subscription to THE GENTLEMAN'S MAGAZINE and get your money back if you don't like it? Nothing like it ever published. Tells of his clothing and fashions, his dens, his sports, games pipe and glass, books, manners, etc., with stories, business articles and lighter matter.

Dollar a year.  
Quarter for 3 months.  
Dime a copy.

## THE GENTLEMAN'S MAGAZINE

180 Monroe St., Chicago.

## Attention Inventors!

## LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

Charge, fifty cents to one dollar, depending on size of list.

In ordering, please state class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.



## Canadian Peat-Fuel Operations.

Recognizing that a good and cheap substitute for anthracite coal would prove a great boon to the people of many States of the Union, and having learned that the efforts in Canada to produce dense fuel blocks from peat have within the last few months been brought to a successful issue, the U. S. Consul at Toronto has made careful inquiry with a view to reporting whatever has been definitely accomplished; and he finds that practical experiments, which have been perseveringly continued for some years, have now resulted in the economical production of a salable peat fuel, highly satisfactory for domestic purposes.

Manufacturing operations on a commercial scale have been reported upon by engineers of high standing, and all agree in the opinion that methods and appliances are now available whereby peat briquettes may be produced, ready for shipment, for a maximum manufacturing cost of \$1.50 per ton, and probably for considerable less in plants of large capacity.

A number of experienced business men and Government officials concur in the engineers' conclusion, and it is found that the large majority of customers are much pleased with the fuel, which, if burned with proper regard to the few simple precautions necessary to insure best results in combustion, can not fail to meet the most exacting requirements heretofore expected of anthracite coal. There is, however, some difference of opinion as to the length of time a given weight of peat briquettes will burn, as compared with the same weight of anthracite. Theoretically, the heat units in peat being fewer, it may be argued, it must burn out faster; but with effective control of drafts, it is surprising how nearly its lasting quality approaches that of hard coal, due doubtless to the fact that more perfect combustion is usually had in the burning of peat under ordinary conditions, the waste in burning coal certainly being greater than in peat briquettes, both fuels being fired by methods in common use. Preeminently to two individuals (Jos. M. Shuttleworth, of Brantford, Ontario, and Alex. Dobson, of Beaverton, Ontario), in association with the Peat Machinery Supply Company, Limited, of Toronto, and the Peat Development Syndicate, Limited, of Brantford, is due the success of this new industry; and it is satisfactory to note that conclusions do not rest on mere laboratory experiments, but on results demonstrated at practical plants, turning out fuel in commercial quantities.



# A Remarkable Offer

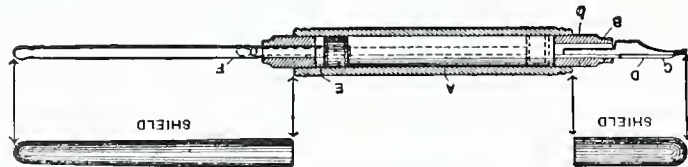


## The "POST" SELF FILLING FOUNTAIN PEN.

No Filler. No Soiled Fingers. No Lost Time. Simple and Perfect.

### THIS IS ITS CONSTRUCTION

IT IS AWAY AHEAD OF ANY OTHER PEN MANUFACTURED BECAUSE OF ITS SELF-FILLING AND SELF-CLEANING FEATURES.



BEING THE ONLY ONE MANUFACTURED HAVING THESE CONVENIENCES.

We will send this famous pen, postpaid, and one years subscription to "The Inventive Age," for \$2.00.

Every Inventor in the country needs The Inventive Age, and everyone needs a pen. Here's your chance to get a bargain.

There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the "Post" has secured. We have testimonials that a million dollars could not buy. In the list will be found leading men in politics, finance, law, religious movements, literary men, bankers and business men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the "Post" and in terms of praise simply unqualified. Send for list of testimonials.

Address: **THE INVENTIVE AGE Publishing Co.** 918 F St. Northwest, Washington, D. C.

### Our Great Popular Offer!

....A....

### Complete Electrical Library

By PROF. T. O'CONOR SLOANE.

...A...

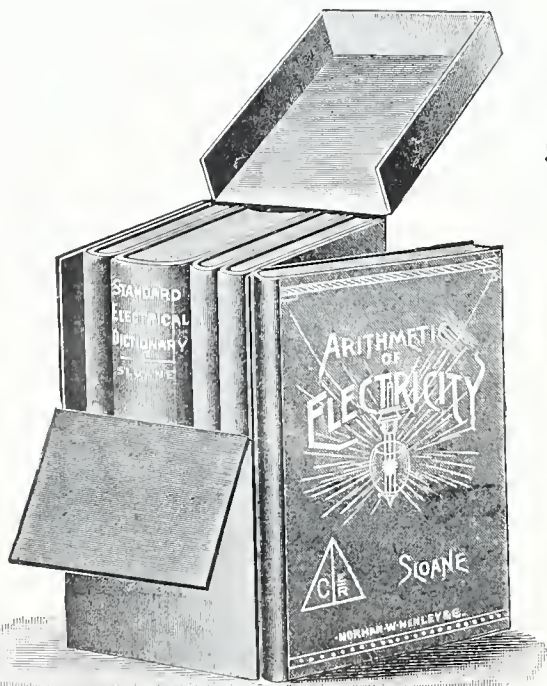
\$7.00

Library

for

\$5.50.

Comprised by  
the following  
books:



5 Volumes,

1300 Pages,

Over 450

Illustrations.

Electricity Simplified ..... Price 1.00  
Arithmetic of Electricity..... " 1.00  
Electric Toy Making..... " 1.00  
How to Become a Successful  
Electrician..... " 1.00  
The Standard Electrical Dict'y 3.00

**Our Great Special Offer.**—We will send prepaid, the above five volumes, handsomely bound in blue cloth, with silver lettering, and enclosed in a neat folding box, as shown in the illustration, at the **Special Reduced Price of \$5.50** for the complete set. The regular price of the five volumes is \$7.00

\*Order direct from us while the opportunity lasts. Any of the above books sold singly at the published prices. You save \$1.50 by ordering the complete set from us. Sent prepaid on receipt of price. Remit by draft, postal money order, or express order.

Address: **THE INVENTIVE AGE Pub. Co.,** 918 F Street, N. W., Washington, D. C.

### MECHANICAL - - - - - - - MOVEMENTS, Powers, Devices and Appliances:

By Gardner T. Hiscox, M. E. Price \$3.00.  
Author of "Gas, Gasoline and Oil Engines."

Large 8vo.

Over 400

Pages

Handsomely

Bound in Cloth.



1,649 Specially  
Made  
Illustrations  
With Descrip-  
tive Text.

PRICE, \$3.00

**A** **DICTIONARY** of Mechanical Movements, Powers, Devices, and Appliances, embracing an illustrated description of the greatest variety of mechanical movements and devices in any language. A new work on illustrated mechanics, mechanical movements, devices, and appliances, covering nearly the whole range of the practical and inventive field, for the use of Machinists, Mechanics, Inventors, Engineers, Draughtsmen, Students, and all others interested in any way in the devising and operation of mechanical works of any kind.

Sent to any address on receipt of price.

Address: **INVENTIVE AGE Pub. Co.,** 918 F. St., N. W., WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

THE *Inventive Age* AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR.  
No. 3.

WASHINGTON, D. C.--MARCH, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

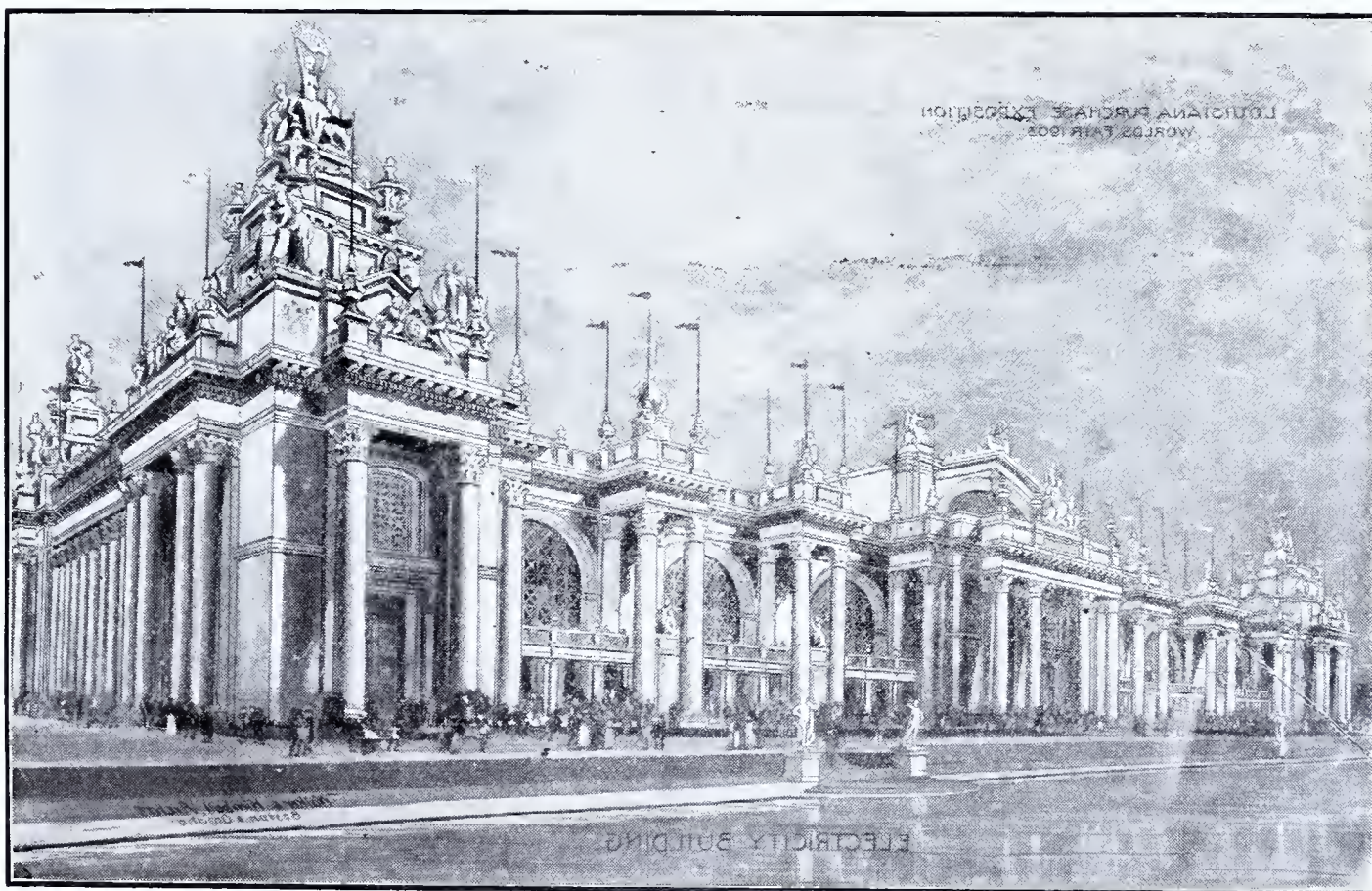
THE LOUISIANA PURCHASE EXPOSITION.

THE ELECTRICITY BUILDING is nearing completion. The contract for it was awarded on March 8, 1902 to William Goldie Sons Company, the contract price being \$399,940. The building was planned by Walker & Kimball of Boston and Omaha, who were chief architects of the Omaha Exposition. The structure is located on the main central avenue and will form one of the leading elements of the main exposition picture. It has a frontage of 650 feet toward the north and 525 feet toward the east, facing the main lagoon.

The design is a bold columnated treatment of the corinthian order. The columns are carried well down toward the ground, to give height to the facades.

The plan of the building is simple and well treated, showing an effect to supply as much exhibit space as is possible with the 292,000 square feet of floor space. The exhibit space is compact and symmetrical. An extensive balcony will sweep around four sides of the building, supplying 100,000 square feet of additional space.

A tremendous traveling crane, to be used in the installation of the big electrical machinery, which is to be shown in the building, will run on tracks in the western bay. Two big toilet rooms are to be located in the court of the building. The doors of the building will be of gigantic dimensions, 11 by 18 feet. The building will have 176 trusses, the largest span being 82 feet



ELECTRICITY BUILDING.

The facades will be well accentuated by elevated pediments and tower effects over the four main entrances and at the corners. Over the accentuated places, as well as over the twin columns, which form a pleasing variation of the treatment of the facades, opportunity for ample sculptural decoration is supplied.

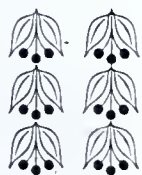
The fenestration is bold and appropriate, giving ample light and substantial wall treatment. On two sides of the building are to be loggias, which will add pleasing effects of light and shadow. There will be numerous openings on the facades, such as exhibitors always seek in selecting their exhibit space.

in length. One hundred and eighty-five tons of iron and steel will be used.

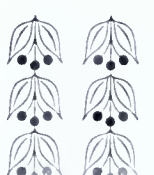
In the Electricity building the specifications provide for a temporary stairway to be put up of rough lumber and to be taken out before the completion of the building. The stairway is to lead to the roof. The object of this is to make the building a show place during construction so that visitors may ascend to the roof without the necessity of climbing ladders and crawling through scuttle holes, and to make it possible for women to get a view from the same point to which men might ascend by ladders.



1904



1904





## - - GOOD ROADS - -

And One Way to Obtain Them.

THERE is no question before the public today which is being given more attention than that of good roads. There have been bills presented in Congress, asking for an appropriation from the Federal government to keep the roads in order, just as the Federal government is asked to appropriate every year millions of dollars for deepening and improving harbors and rivers. Once in a while there is a Good Roads Convention held, when the subject of how a practical road should be maintained is

discussed with much learning on both sides. The Agricultural Department has given this matter much thought, and has attempted to educate the public as to how cheap a good road can be built and maintained. It has been claimed that the construction of a good road will pay for itself in a short time in the improved business that will result from the traffic over the road. However this may be, whether a good road would be a financial suc-

cess or not, it is manifest that the movement in behalf of good roads is a most commendable one, and the agitation should not stop. For the keeping of the highways in condition, one of the most valuable machines that road authorities can possess, is a mechanical road scarifier. Among the dangers and inconven-

iences arising from hand-picking, the flying of stones is the chief, and then again, by the aid of a suitable machine, work can be carried on both day and night, since only ordinary hand lanterns are necessary to show the depth of the cut.

In refacing rough roads, a road-breaking machine is extremely valuable. The saving of time and labor is, however, the chief recommendation, for in most towns, it is quite impossible to obtain experienced men in road-making to break up a road at

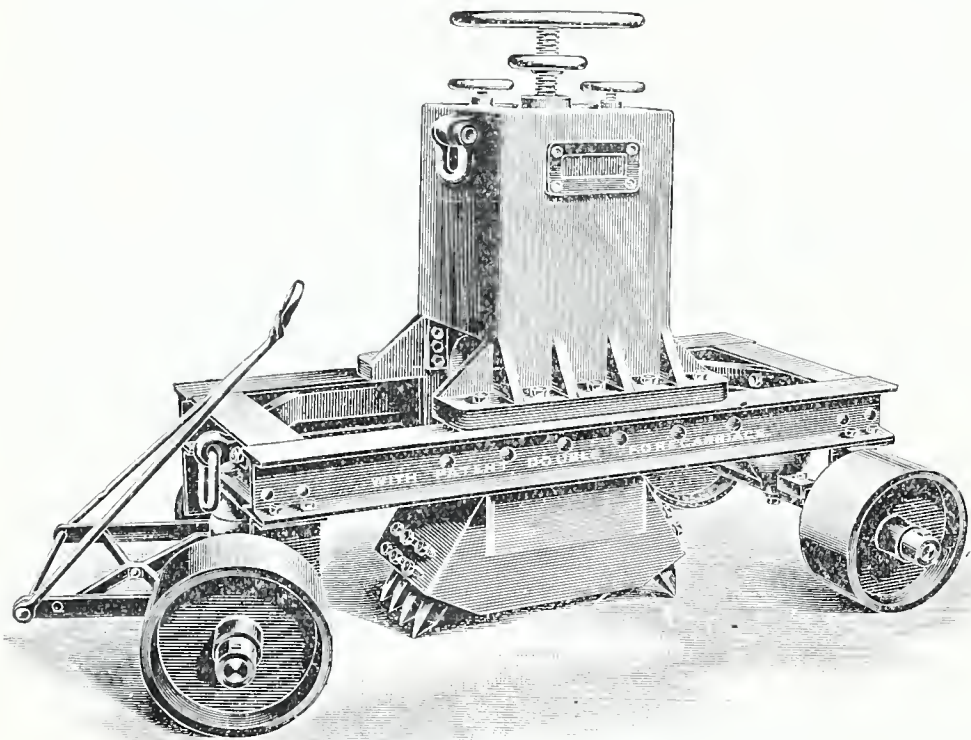


Figure 1.

discussed with much learning on both sides.

The Agricultural Department has given this matter much thought, and has attempted to educate the public as to how cheap a good road can be built and maintained. It has been claimed that the construction of a good road will pay for itself in a short time in the improved business that will result from the traffic over the road. However this may be, whether a good road would be a financial suc-

cess or not, it is manifest that the movement in behalf of good roads is a most commendable one, and the agitation should not stop. For the keeping of the highways in condition, one of the most valuable machines that road authorities can possess, is a mechanical road scarifier. Among the dangers and inconven-

iences arising from hand-picking, the flying of stones is the chief, and then again, by the aid of a suitable machine, work can be carried on both day and night, since only ordinary hand lanterns are necessary to show the depth of the cut. In refacing rough roads, a road-breaking machine is extremely valuable. The saving of time and labor is, however, the chief recommendation, for in most towns, it is quite impossible to obtain experienced men in road-making to break up a road at

The cutters, or teeth, are made of steel of suitable section, and are fixed by set screws, or wedges, at or about an angle of sixty degrees in the inner case.

A notable feature of Mr. Asplen's machine is the double-locking and un-locking fore-carriage, the effect of which is, that there is no necessity to turn the scarifier around at the ends. The small amount of vibration is another point in its favor. If desired, a draw-bar, as shown in the first illustration, can be furnished for the purpose of moving the machine by hand from village to village. The tines of the cutting arrangement insure a uniform depth of cut which can be readily adjusted during the work. There are comparatively few parts to the machine, and they are of great strength, so that there is little liability of its getting out of order. The cutting tools are reversible and are adjustable by set screws so that any workman can fix them, and if necessary effect repairs. It is claimed by Mr. Asplen, that his scarifier with four tines can be worked efficiently with sixty pounds of steam. This is an exceedingly important point, as the question of power required must be considered in determining on the character of machine to be used.

Mr. Asplen's scarifier has great possibilities, and its easy management and unusual economy are characteristics which entitle it to the earnest consideration of county officials, highway boards, contractors, and other users of this class of machinery.

The second illustration shows the machine when at work in Ipswich, England, operated by an Aveling & Porter 6 h.p. road roller, and cutting a track 14 inches wide, the depth of cut being between 2 and 3 inches, at the rate of nine yards per minute. Thus, in three minutes, it accomplished as much as a man with a pick could have done in a whole day.

The invention has been patented in this country, and the inventor is desirous of hearing from any one who would be willing to exploit the invention in the United States.

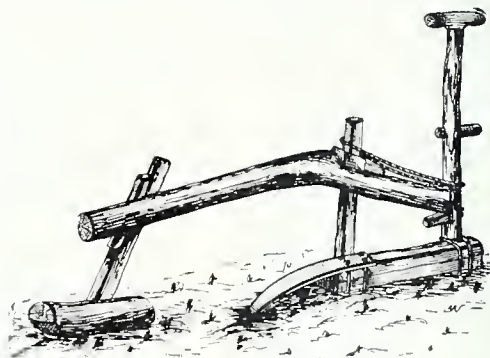
### PLOWS IN CHINA.

North China, Mongolia, Manchuria, and that part of Siberia bordering on the Pacific are destined soon to become consumers of American agricultural implements. The greater part of that country is susceptible of cultivation. The production of wheat is already a leading industry in various localities. In the October AGE we illustrated how grain is stored in that far-off region. Its cultivation is carried on without the use of any modern machinery; but in spite of the crude methods, the wheat usually sells at about one-half the price as in the United States, and the natives would increase the production by millions of bushels for the price of 30 cents gold per bushel delivered at mills.

The vast area of splendid soil for grain production, the reliability of climatic conditions that make crop failures and famine most uncommon, the nearness of the country to the Pacific Ocean, the development of railways, and the frugal, industrious

habits of the people all promise a great increase in wheat and grain production, and make this an inviting market for agricultural machinery.

There are several reasons why this territory is a good field for marketing agricultural implements. First, the country is not, as a rule, thickly populated: this is especially true of Mongolia, Manchuria, and Siberia. Laborers are imported each season to assist in planting and harvesting crops. There exists, therefore, more of a disposition to save labor than is generally found in other parts of China. Second, all of this country is abundantly supplied with animal power. Ponies, mules, donkeys, and cattle are used in every way to relieve the burdens of men. There are few parts of the world where animal power is more generally used than here. Plows, harrows, rollers, carts, and various other crude machines, locally made, are in constant use. The hand tools and the methods in use in other parts of China for cultivating, harvesting, and marketing crops are not so extensively employed here. As the people are so well trained in the use of this animal power and already use many crude machines, there will not be serious difficulty in introducing better appliances. Third, the country is generally cultivated in much larger fields than in middle and southern China, and the employment of improved machinery would involve no change in the nature of their industry. Fourth, the opening of the country by railroads will reduce the cost of getting products to markets and at the same time increase the supply.



The illustration given herewith presents a general view of the plow commonly used. The only iron about the implement is a long point that turns down to enter the ground. There is also another form of point, wider and shorter than the one shown in the cut, that very much resembles that of the shovel plow. These points are cast in considerable quantities in the seaports from scrap iron that is imported. They are light, inferior articles and cost from 20 to 30 cents gold each.

Blacksmiths with wheelbarrows loaded with tools, bellows, casting molds, etc., go among the interior villages every spring, to make and renew the plows. The farmers pay 15 or 20 cents for a new plow point made from their own old iron.

Above all other considerations, the plow must be cheap—as cheap as it is possible to make it, and so cheap that it would not be used in the United States. The form must differ very little from that now in use by the natives—short beam, single handle, and as simple of construction as possible.

The value of an improved plow will lie in deeper plowing with the same power. This would have to receive practical demonstration in every hamlet, and care should be taken to avoid some superstition, which might be done by giving the plow a favorable name.

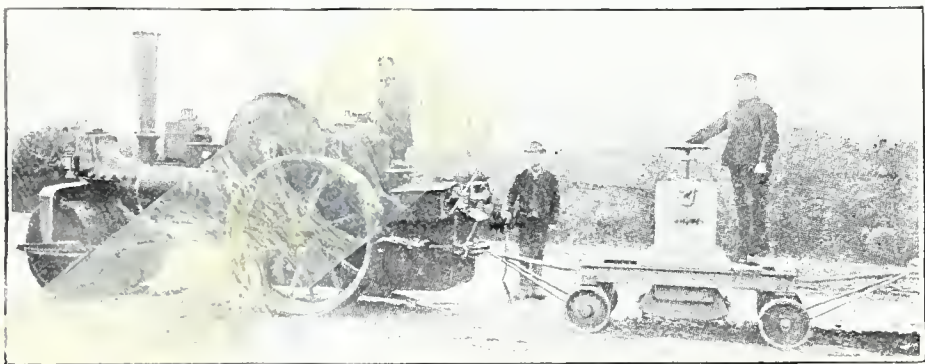


Figure 2.

cess or not, it is manifest that the movement in behalf of good roads is a most commendable one, and the agitation should not stop.

For the keeping of the highways in condition, one of the most valuable machines that road authorities can possess, is a mechanical road scarifier. Among the dangers and inconven-

The apparatus may be said to comprise an outer case of cast iron or cast steel, and an inner case of the same material. The lower portion of the inner case which carries the cutting tines, is regulated by spiral springs, and adjusted to the required depth by a screw arrangement working through a phosphor-bronze bushing.



### Manufacture of Electro-Steel in Sweden.

At the meeting of the Iron Manufacturers' Association at Jernkontoret, Sweden, Engineer F. A. Kjellin and Mr. Benedicks gave some very interesting information about the production of electro-steel at Gysinge.

The problem of smelting steel by electricity has for a long time attracted the attention of inventors, and experiments have been made here. By the advice of Engineer Kjellin, Mr. Benedicks decided in 1899 to build at Gysinge an electric steel furnace without electrodes.

In the latter part of February, 1900, the first furnace was finished and ready for trial, and after a few experiments the first ingot was produced. The steel was found to be of excellent quality. The problem was thus solved technically, but not economically: for, with the dynamo 78 kilowatts used, not more than (575 pounds) of steel were obtained in twenty-four hours, and in the furnace there was not room for more than (176 pounds.) A larger furnace was seen to be necessary, and this was completed in November, 1900, and proved to be a great improvement. In the second furnace, which held (397 pounds,) from (122 to 134 pounds) of steel were produced in twenty-four hours.

Engineer Kjellin said that the steel produced is of superior quality and characterized by strength, density, uniformity, toughness, and the ease with which it can be worked in cold, unhardened condition, even when containing a very high percentage of carbon. Compared with other steel, it also has less tendency to crack or warp when hardened.

The reason why this steel in certain qualities differs from other steel, especially in its softness when unhardened, is considered to be its freedom from gases. The manufacture of special steel, with nickel, chrome, manganese, or wolfram, will, of course, not meet with any difficulties. The chrome steel and wolfram steel produced at Gysinge has proved to be excellent for lathe tools. When used for permanent magnets, the Gysinge wolfram steel has been found to give stronger magnets than other wolfram steel and has not warped in the hardening.—*Trading and Shipping Journal, Gothenburg, Sweden.*

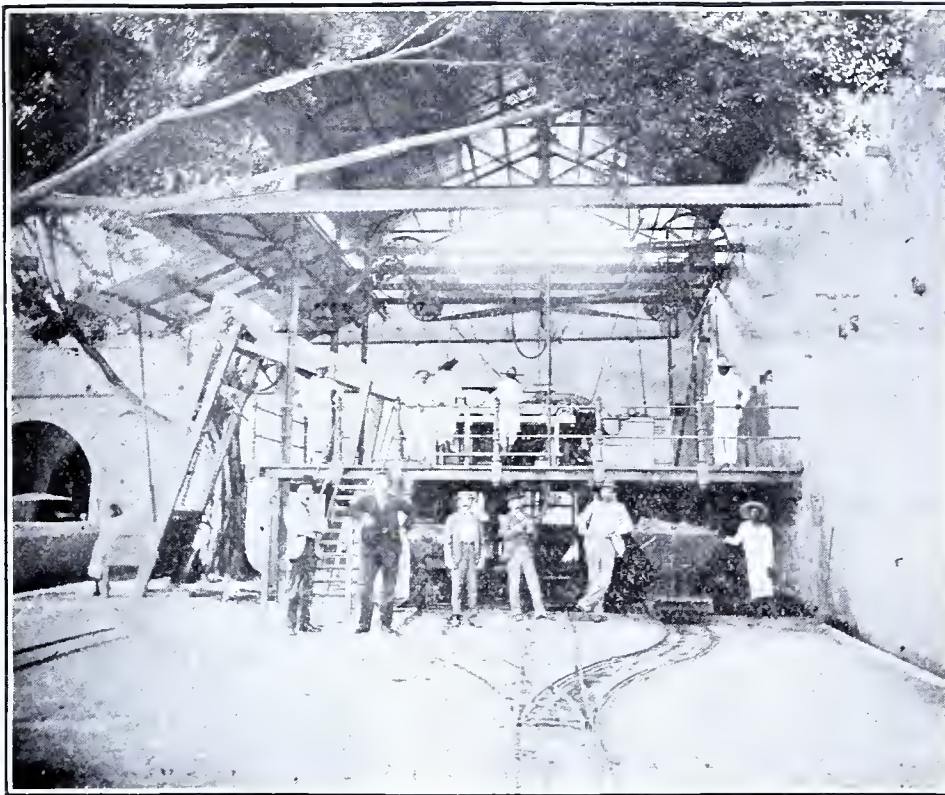
### A Useful Finger-Shield.

Those who frequent public libraries are often inclined to feel some repugnance at handling popular books of reference on account of the very dirty condition of the leaves; and their disgust is not lessened by reflecting that much of the soiling is due to the common practice of moistening the finger as the pages are turned over. It is a matter of common knowledge, too, that infection can be conveyed by books, and it can be easily imagined that this very obnoxious finger-moistening practice is conducive to that end. The busy person of clean habits and clean ideas will therefore be thankful to hear of a rubber finger-stall, with corrugated surface, which has been introduced for their relief. From personal use we can testify to its efficiency in clinging to the paper with greater tenacity than the naked finger, and to the sense of comfort and cleanliness which it confers upon its user. The cost of this valuable little device is one penny, and we feel sure that it will meet with large demand. We think, too, that it will be found useful in certain industries, such as photography, where glass has to be constantly handled. It is manufactured by the Scottish Waterproof Company, of Cockburn Street, Edinburgh, Scotland.—*Chamber's Journal.*

### PROCESS OF EXTRACTING FIBRE FROM THE AGAVA PLANT.

Sisal grass, sisal hemp, henequen, are the various commercial terms applied to a fibre that is neither a grass nor a hemp, and is not produced to any great extent in Sisal—a port in Mexico. The agave plant, which

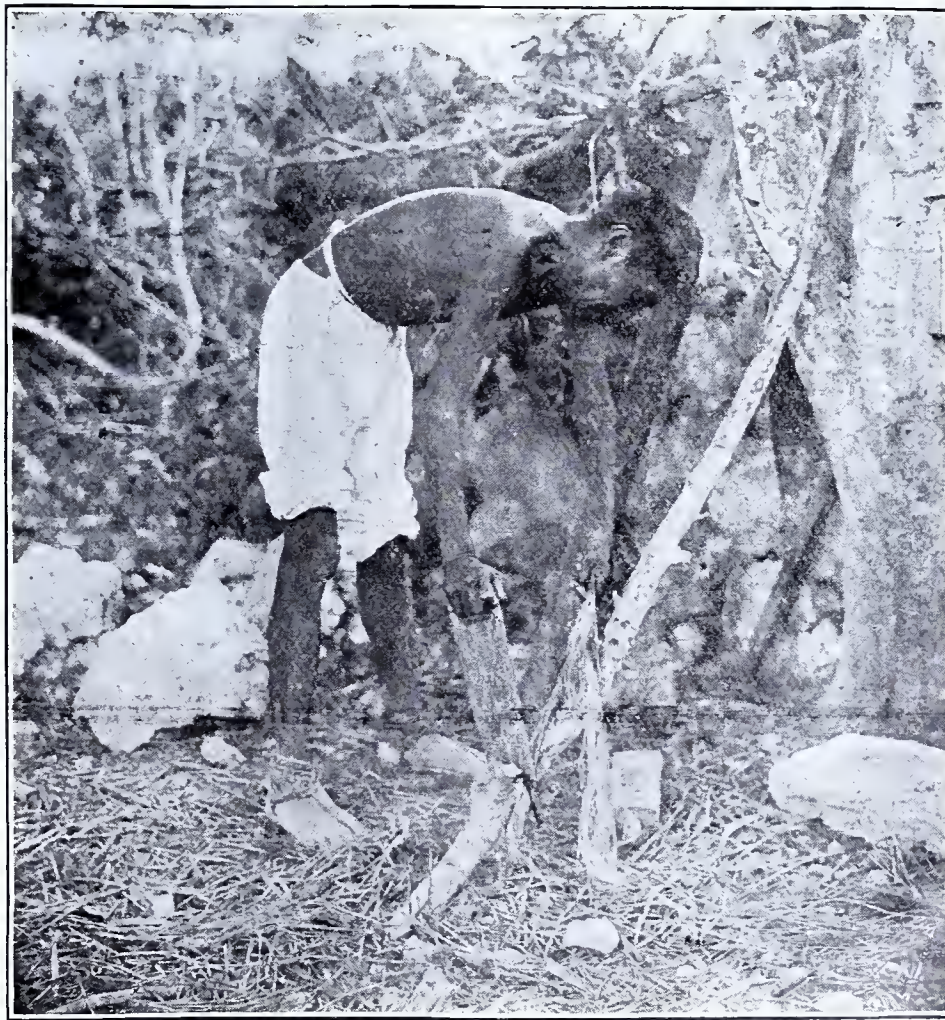
ever, has no intoxicating properties, and its fibre is universally employed in commerce. The plant is of a peculiar shade of green, with many thorned leaves. The fibre has probably been used for centuries. At first,



Modern Apparatus at Work.

yields the fibre, is one of the most useful plants of the southern republic. One branch of the family produces the pulque, the famous intoxicating drink of Mexico. Great

the early inhabitants of Mexico did not attempt to extract it from the thick pulp, but took the leaf and wilted it in fire, then split it and used the splits as thongs for fastening.



Native Cleaning the Fibre.

fields of this plant are grown on the table lands, and long pulque trains, like the milk trains of the United States, roll daily into the City of Mexico. The agave sisalens, how-

The leaves, treated in this way, make thongs of great strength, and as they dry they bind with remarkable force. Afterwards, primeval man found that if he cleaned off some of the thick

pulp and green corrosive juice, he could get a firmer hold and so bind tighter. Then he learned that two or three shreds, twisted together, served the purpose of a cord, and in this way the first sisal rope was made.

In the days of Aztec glory, the people of Mexico used agave ropes in building. The rulers in Yucatan, like those of ancient Egypt, did not employ engines and mechanical devices to construct their pyramids, and palaces. Human muscle and ropes of sisal grass were used to lift the great stone blocks into place. If ten ropes and a hundred slaves were not enough, a hundred ropes and a thousand slaves were called into service. The artists of those days, the sculptors in stucco, placed cords and plaited bands of fibre upon their figures. From the investigation of antiquaries, it appears that these are the same as are commonly used today.

In the last century, an effort was made to find a market for the fibre in New York, and it was found, although it sold well in competition with Manila hemp, that the prices obtained were not sufficient to cover the expense of the laborious processes of extracting the product by hand. The Government offered a bonus of ten thousand dollars to the person who could produce a machine for successfully extracting the fibre. Many attempts were made, but proved futile, until a Franciscan friar devised an apparatus that served the purpose for a quarter of a century. Today, half a dozen machines are in the market, some of them marvels of intricacy and efficiency. The accompanying illustrations show the old methods of cleaning the fibre, and a modern apparatus at work.

### Safety Dress for Electrical Workers.

The idea of a safety dress for the protection of those whose business requires them to work around high-pressure electrical apparatus appears to be an inviting field for inventors. The idea is not altogether a new one, however, for over ten years ago, when the fatalities due to contact with high-tension overhead wires were numerous, a number of protective devices to be worn on the body were exploited, but so far as known not one of them have been adopted. Somewhat recently Prof. Artmeiff has devised a safety dress of this nature which is said to be quite efficient. The dress, which has been tested in the high-tension laboratory of Siemens & Halske, consists of fine, thickly woven-wire gauze which covers the feet, head, and hands of the wearer. Its weight is 3.3 pounds, and its resistance is 0.017 ohm from hand to hand, practically inappreciable as compared with the resistance of the body. Wearing this dress, the experimenter freely subjected himself to a number of rather hazardous tests, amongst others, one in which, with safety to himself, he short-circuited with his mailed hands the terminals of a generator that was developing 1000 volts and 200 amperes. A rule requiring the use of such a dress, however, would probably be found quite as difficult to enforce as the rule which requires the employees of the different electrical companies to wear rubber gloves—a rule which, notwithstanding that it is obviously in the interest of the employee, is perhaps as often followed in the breach as in the observance.—*Cassier's Magazine.*

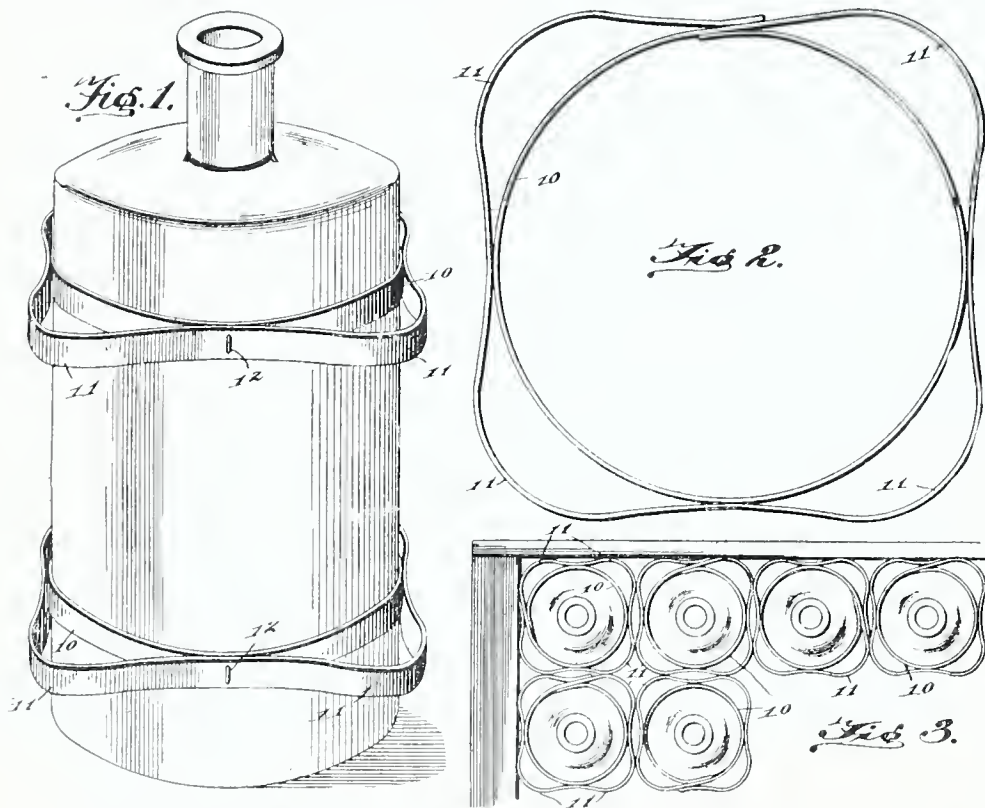


# CLEVER NEW PATENTS.

Bottle Protector.—Seeder.—End-Gate Hanger.—  
Calculating Machine.

## Bottle Protector.

One of the best wrappers for bottles, jars and the like that has yet been presented to the public is the invention of Mr. John W. Steel, a well-known resident of Portsmouth, Va. Mr. Steel has combined in this new device efficiency, durability and cheapness of construction, features which are bound to place it among the list of successful inventions. The structure will be readily understood by referring to the accompanying illustration, wherein figure 1 illustrates the invention applied to a bottle, figure 2 is an edge view and figure 3 shows the manner of packing bottles in a box. Each protector is preferably made of a single strip of veneer, though other material may be used and separate pieces employed if desired. An inner bottle-engaging ring 10, is formed and about the outside of the same are arranged a number of loops constituting buffers 11, that are secured to the ring at separated points by staples 12. The strips may be of any width desired and in use, one or more of the protectors is placed upon each bottle in the manner shown. When the bottles thus protected are packed into a box, the buffer loops will be in contact, while the bottles will be spaced apart and held in this spaced relation by yielding con-



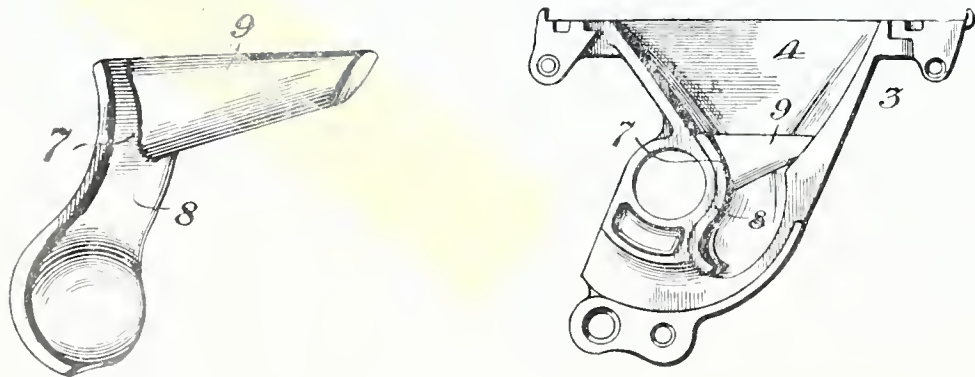
tacting separators. Moreover, the buffers prevent the bottles contacting with the box and also serve as protectors after the bottles have been removed.

It will be evident that these devices are far superior to straw board and similar protectors now so generally used and they will certainly supplant the same. The patent secured thoroughly covers the invention, and the manufacturer who obtains the right to make and sell the protectors is bound to have a good investment, as the general nature of their use will insure the sale of great quantities. The material of which they are made is cheap and the work required to manufacture them is of the simplest.

Mr. Steel has decided to sell or place the invention in the hands of a reliable manufacturer who can and will push it. It will, therefore, be noted that the field is open to manufacturers of veneer goods as well as packers of bottles, jars and similar articles. Those who may be interested can obtain any information desired regarding the same by communicating with Mr. Steel at 1000 Washington St., Portsmouth, Virginia. Samples sent on application to interested parties.

## Seeder.

Mr. William Fetzner, a well-known inventor of Middletown, Ohio, is the patentee of this seeder, which is of the type known as "force-feed." Heretofore, in operating seeders of this kind in which hopper-shaped cups have been used for containing the rotary feed-wheel, an actuating gear has been commonly employed provided with a number of rings of gear teeth upon its face, each ring being of a greater radius than the one within it, so that by moving a pinion or beveled gear into engagement with any one of the different rows of teeth, different speeds may be imparted through the beveled gear and intermeshing gearing to the feeding-disk or wheel of the feed cup. In using these features, it has

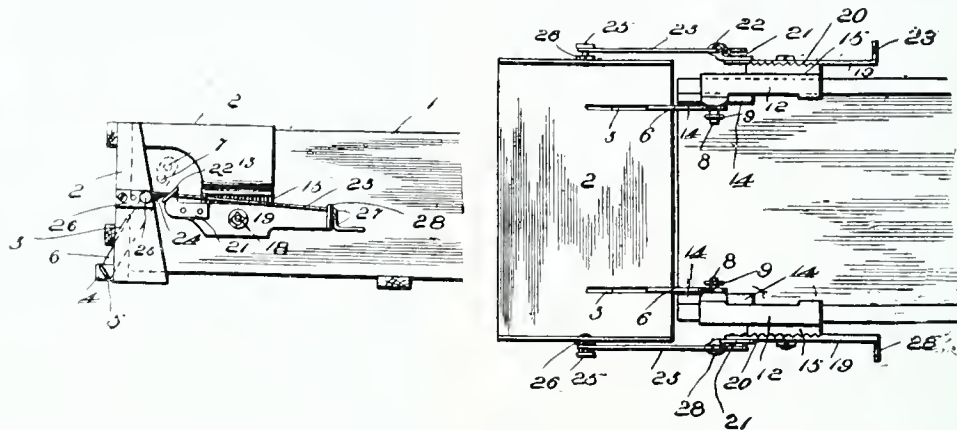


been found desirable to have a different number of adjustments for feeding various kinds of grain and in various quantities per acre. This necessitated so many rows of gear teeth upon the driving gear, that said teeth were decidedly small and were found to wear out easily and rapidly. By the present invention, the amount of feed delivered from the seed cup is capable of being controlled by means placed within the cup, and is not dependent upon the actuating gear. The seed cups are made double, being provided with two compartments,

the revolving feed wheel being arranged between them. One side of the wheel is made with a larger flange than the other side, so that it is capable of delivering either larger seed or a greater quantity of small seed. Reducers are employed, which can be placed in either compartment and control the amount of seed fed by the wheel. The illustration shows the reducer consisting of the body portion 8, which is made to fit quite closely the rear contour of the hopper portion of the seed cup, its lower end projecting a suitable distance into the throat of the seed cup to reduce or limit the quantity of seed which can pass from the cup.

## End-Gate Hanger.

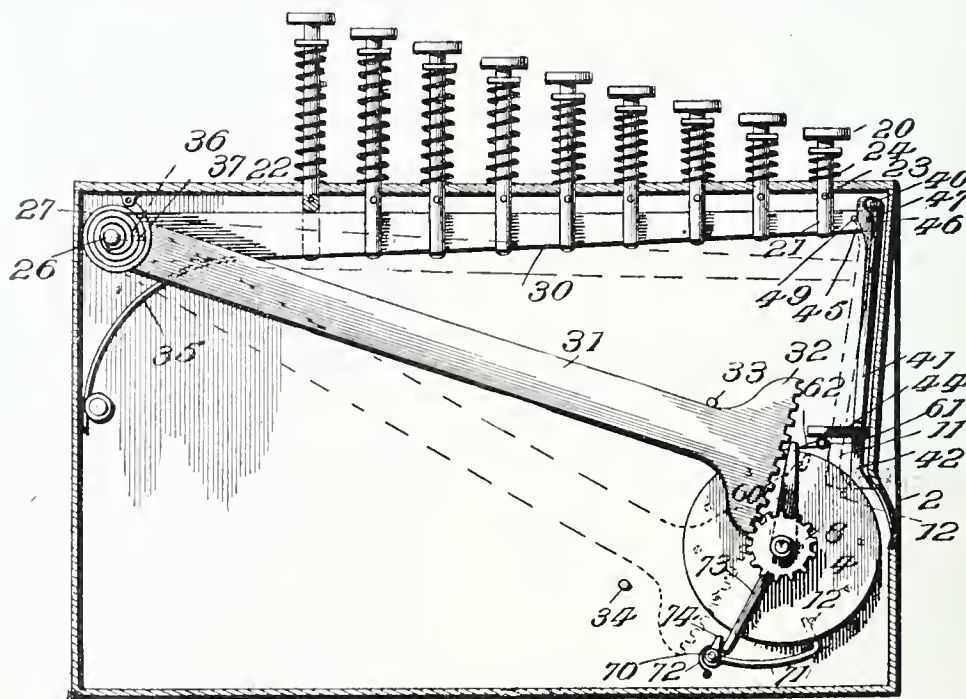
A new end-gate hanger for wagons has been patented by Mr. Francis M. Sturgis, of Shelbyville, Illinois, who has assigned a one-half interest in his patent to Mr. William D. Roberts, of the same place. The object sought and obtained in this invention is the provision of a simple structure which entirely dispenses with the use of bolts, and besides being durable, can be readily attached to or disengaged from a vehicle, and is adjustable to hold the gate at different angles. The wagon-body, and end-gate or scoop, may be of the ordinary construction, except that inclined grooves or channels are provided in the latter. Secured upon the outside of the gate and straddling the lower ends of the grooves are straps, in which are held the lower ends of arms having two sets of openings to receive pins so that the end-gate may be held in two positions. Two fastenings are employed to hold the gate in place. In each, the pin or projection, above described, is carried by an inner downwardly-projecting arm, there being another similar arm formed integral with the body of a fastening plate. This body is adapted to rest upon the top edge of the side of the wagon-body, while the two arms contact the inner side thereof.



In this position, the arms prevent the fastening from slipping. The lower end of a flap employed, is provided with an outwardly-curved milled or corrugated portion and terminates in a lower flange, a vertical opening being cut in the body of the corrugated portion. Passing through said opening is a bolt which adjustably holds a horizontal plate closely in contact with the corrugated portion, so that the two are held together. Secured upon the outer end of the plate is a fitting carrying a guiding-eye for a rod that is connected with a plate secured to the gate. The inner end of the rod is provided with an S-shaped bend, which acts as a catch to help support the gate when open, and which engages the hook of the plate when the gate is closed, the rod being sprung into this position in order to more securely hold the rod in place.

## Calculating Machine.

Mr. George F. Harrison from Knoxville, Tennessee, has patented a calculating machine, which is shown to be positive and accurate in operation and may be sold at a low price. In calculating machines heretofore devised having a series of rotatable numeral wheels or disks, it has been common to separately move each wheel forward for the purpose of registering thereon, the wheels upon which no registry is being made remaining at rest. The principal feature of this invention resides in practically the reverse of the old principle—namely, the wheel upon which registry is to be made is held immovable, while the other wheels are moved backward together through a number of spaces directly cor-



responding to the number to be registered on the immovable wheel, then all of the wheels (including the one which was held immovable and upon which registry is to be made,) are moved forward together through the same number of spaces as on the backward movement, the final result being a change in the position of the wheel which was at first held immovable corresponding to the number registered. By operating upon this new principle, much simpler actuating mechanism can be employed than is commonly used in machines operating upon said old principle. The illustration is a vertical sectional view of the machine, and represents the keys 20 connected to the pivoted bars 30, and operating the arms 31, and through them the numeral wheels, by means of certain springs 27 and 35, and other connections 41, 26 and 13.



## ELECTRIC FIRE PUMP.

IN the January issue of the AGE we gave a brief description of the electrically operated fire pump at Rouen, France; but we are now able to produce an illustration and full information as to the construction of this new fire-fighting engine.

The idea of this pump, which is the only one of its kind in France, if not in the world, was suggested to M. Robert Lefebvre, the captain of the Rouen Fire Company, by a conversation he had last year with a German engineer at the Berlin Fire Extinguishing Exposition. This latter had conceived the idea of an electric pump for cleaning the walls of buildings, etc. If sand thrown by an electric pump could clean buildings, why could not water thrown in the

tramway rails. There is beneath the covering a compartment containing two circuit breakers, a circuit closer, and a commutator.

To start the apparatus, it is only necessary, after connecting the two wires to the line giving the energy, to close the circuit and start it running slowly with the rheostatic guide; the guide being fastened to the circuit breaker, the motor runs normally. The time necessary for starting is about a minute.

The bobbins on which are wound the conductors can receive 656.16 feet of isolated wire; if to this is added the same number of feet of hose on the reel, and 114.83 feet to which the water can be thrown, it is seen that a distance of 1,427.16 feet can be

## IMPORTANT COURT DECISION.

### DECISION OF THE U. S. COURTS.

#### Supreme Court of the United States.

E. BEMENT & SONS v. THE NATIONAL HARROW COMPANY.

Decided May 19, 1902.

#### 1. A CONTRACT IN RESTRAINT OF TRADE.

Held that certain contracts in this case were not in violation of the act of Congress prohibiting combination in the form of trust or conspiracy in restraint of trade.

#### 2. SAME—ACTION BY ATTORNEY-GENERAL—DEFENSE BY PERSON SUE ON CONTRACT.

Assuming that the Attorney-General of the United States is the only person who can bring an action under the act of Congress providing that every contract combination in the form of trust or conspiracy in restraint of trade is illegal and punishable by fine and imprisonment, yet any person sued upon such contract may set up its illegality as a complete defense to the suit.

#### 3. SAME—ILLEGALITY OF CONTRACT A PERFECT DEFENSE.

A private individual when sued upon a contract may set up as his defense that it is void because in violation of an act of Congress, and when proved, it is a valid defense to any claim made under the contract.

#### 4. PATENTS—RIGHT OF PATENTEE TO CONTROL USE AND SALE.

A patent is a monopoly recognized by the Constitution, and an owner of a patent has the right to sell it or to keep it, to manufacture the article himself or to license others to manufacture it, to sell such article himself or to authorize others to sell it, and he is not bound to use his discovery himself nor to permit others to use it.

#### 5. SAME—SAME—RIGHT TO IMPOSE CONDITIONS AS TO USE.

The owner of a patent may assign it or sell the right to manufacture and sell the article patented upon the condition that the assignee shall charge a certain amount for such article.

#### 6. SAME—CONTRACT FIXING PRICE OF ARTICLE NOT ILLEGAL.

The general rule is absolute freedom in the use or sale of rights under the patent laws. The very object of these laws is monopoly, and with few exceptions any conditions imposed by the patentee and agreed to by the licensee as to use or sale of the article will be upheld by the court. The fact that the conditions in the contract keep up the monopoly or fix prices does not render them illegal.

#### 7. SAME—CONTRACT IN RESTRAINT OF TRADE—LAW NOT APPLICABLE TO PATENT RIGHTS.

The statute prohibiting contracts in restraint of trade clearly does not refer to that kind of a restraint of interstate commerce which may arise from reasonable and legal conditions imposed upon the licensee of a patent by the owner thereof restricting the terms upon which the article may be used and the price to be demanded therefor.

#### 8. SAME—POWER OF STATES TO CONTROL SALE OF PATENTED ARTICLES.

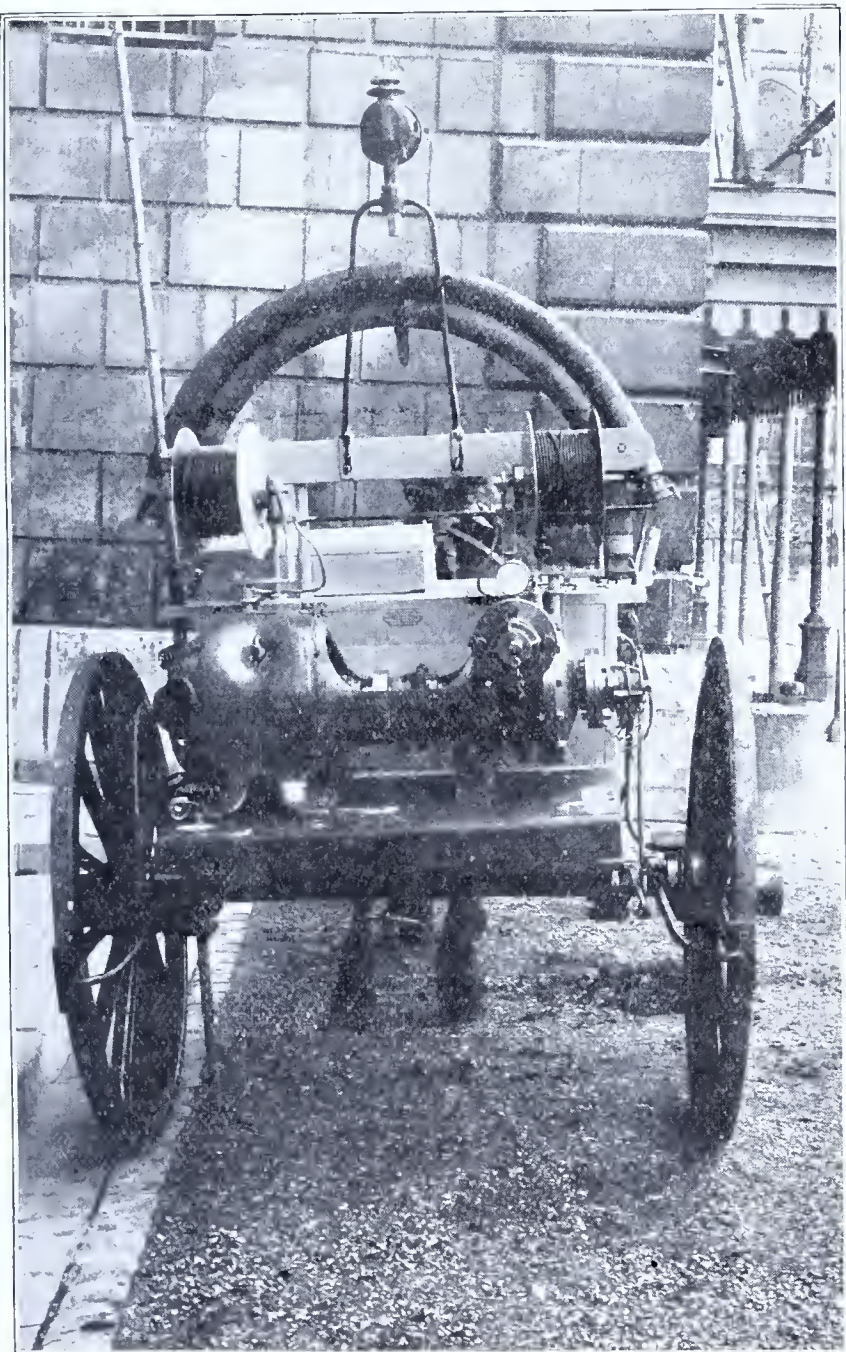
In certain circumstances the sale of patented articles may be controlled within the several states by a legitimate exercise of their powers over their purely domestic affairs, whether of internal commerce or police regulation, and this is not an interference with the right conferred by the patent.

#### 9. SAME—INEFFECTIVE CONTRACTS—CONTRARY TO LAW.

Where a patentee licenses a public telephone company to use his invention, a condition in the contract that the company shall not serve certain parties therewith is of no effect, since the company is a public corporation and common carrier required to serve all alike, and no restraint can be imposed upon it to disable it to discharge the duties imposed by law.

#### Paper-Making Materials.

Only paper of the very best quality is now made from rags, the bulk of that employed for newspaper and book work being manufactured from wood-pulp. Other materials are also coming into use to meet the enormous demand for paper, and plants which were at one time supposed to be of no economic importance are contributing their fibre to the manufacture. Among the new materials may be named bagasse, the refuse of the sugar-mills, formerly a waste product save that it was employed for fuel. Rice-straw, long only used as bedding for cattle, is also enlisted in the service of the paper-maker. Spruce is the wood now generally used in making paper-pulp, and of this there is a vast amount not yet drawn upon in the Dominion of Canada, which is only waiting for railway facilities of transport. In the meantime protests are being raised against the quality of the paper made from these substitutes for rags. It answers the purpose of ephemeral literature; but there is good reason to believe that it rapidly deteriorates, and that books made of it will have but a short life. It is somewhat humiliating for us to have to acknowledge that our modern documents can not compare in permanence with those written on Egyptian papyrus before our own historical period commenced.



same manner extinguish fire? In the solution of this question, the electric fire pump was born.

It is composed of a centrifugal pump and an 8-horsepower motor, which gives normally 2,000 revolutions per minute. A continuous current of 525 volts can be applied. This motor is well covered, so as to prevent all penetration of water. Above are two bobbins: on one is wound the wire upon which the current is received, the extremity being exposed in such a manner as to allow connection with a hook suspended from the trolley wire or electric light wire; on the other bobbin is wound the return wire, the free end being connected with a cast-iron block to be fastened to one of the

covered. The distance that the water can be thrown, nearly 115 feet, is accomplished with an orifice of 0.7 inch and a volume of 92.46 gallons a minute.

The whole machine can be placed on a handcart, or on a little two-wheeled wagon drawn by one horse. Its total weight, with accessories and two men on the seat, is about 2,292.78 pounds. The motor and pump are not longer than 39.37 inches, and about 19.685 inches wide and the same height.

Behind the machine is a reel capable of holding 984.25 feet of hose, two lances, a ladder with hooks, an ax, a hydrant key, a nozzle, etc. The weight of this reel equipped, is 727.51 pounds.

## PATENTS

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-TWO YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

### INVENTIVE AGE

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

E. G. SIGGERS, 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Edward E. Atkinson, inventor, Ada, Ohio; Israel Oberlin, same place, assignee. Drill.—This invention relates to means for locking the drill bit to the stem. The stem has a socket and the bit a shank which fits therein. The shank and the portion of the stem surrounding the same are provided with transverse openings in which a novel construction of wedge-key is placed, and is so arranged that the two parts are securely fastened together. The key is protected by a collar screwed upon the stem and covering the opening.

Olaus B. Jacobs, Roland, Iowa. Two patents. Gates.—These patents cover one of the most unique ideas in stock gates yet produced. The invention may be said to be based on the peculiar modes in which different classes of animals will attempt to pass through a fence. For instance, a sheep will simply try to press through the rails or bar, while a pig will attempt to root under the fence. Mr. Jacobs has taken advantage of these points by providing a gate hung at its upper end, and having locking means so arranged that it will be operated by a pig attempting to go under, though it will not be affected by a sheep or other animal attempting to press through between the rails. As a result, different kinds of animals may be permitted to run together and one may be given more area than another.

In one of the inventions the gate is hung at its upper end and terminates short of the ground. A locking panel separate from the gate is arranged at one side thereof, and is also hung at its upper end, having its lower end located between the gate and ground. A pig attempting to pass under the gate will press against the locking panel first, and move it away from the gate which can thus swing easily, while a sheep will simply press the gate into engagement with the panel and thereby lock it.

In the device covered by the other patent, a swinging locking bar is mounted upon the lower end of the gate and has an operating board hung beneath it, so that it will be moved by the passage of the pigs thereunder, thereby first actuating the lock.

Paul Plotnik, Delano, Minn. Hay Rack.—The object of this invention is to provide simple means for securing the longitudinal and cross beams of a rack together without the use of nails or like fasteners, and another important feature relates to means for properly positioning and holding the beams in exact angular relation. For this purpose, a pair of spaced tie rods are employed, which pass across the beams and are located in the corners formed thereby. Clamp plates are mounted upon the rods and have recessed timber seats in their opposing faces, these seats being located between the rods and in angular relation to each other. An intermediate plate is also placed upon the rods and is designed to be located between the crossed beams, being also provided with the timber seats, so that the beams fitted therein will be in proper angular relation.

Charles F. Deplanty, inventor, Coffeyville, Kan.; Emil W. Roesky, of the same place, assignee. Desk.—It is the aim of this invention to provide means for holding a supply of writing paper in a pile, so that the upper sheet will be substantially level with the platform or top of the desk, and for raising the pile as the sheets are removed therefrom. For this reason,

the structure is particularly advantageous for holding money orders and other blanks put up in blocks or pads. The construction is substantially as follows: the top of the desk is provided with a suitable opening and beneath the same is arranged a boxing. A plunger is slidably mounted in the boxing and is normally drawn downwardly by coiled springs. A shaft is journaled in the desk at one side of the boxing, and is provided with a pair of pulleys around which are passed straps that engage the plunger. The pad or block of paper is placed upon the plunger, which may be raised or lowered by turning the shaft, and thus the upper face of the pad can always be kept on a level with the top of the desk.

James Swan, Topeka, Kan. Journal Bearing. This invention marks an important advance in the means for lubricating the axles of railway cars, though it may be employed for journal bearings of various sorts. The brass is provided with sockets having inwardly extending wedge-shaped lugs. Between these sockets are arranged pockets, in which is placed graphite or other granular lubricant, which is formed into a solid mass by a soluble binder. The inner face of the brass is covered by a lining of Babbitt metal, cast thereon, and filling the pockets, thereby engaging behind the lugs and being held securely in place.

Enoch C. Deskin, Moberly, Mo. Car-Wheel Holding Device. The above title indicates that the present invention also relates to railway matters. It is a device for holding down the car wheel when the journal box is elevated for the purpose of removing the brasses. The invention consists of a body bar, on which is slidably mounted a wedge block having a roughened metallic shoe on its inclined face. The bar is placed upon the wheel beneath the car body and the wedge is then moved so as to engage said body. The result is that the full weight of the car comes on the wheel when the box is jacked up, and there is thus no danger of raising the wheel.

Jacob A. Thomas, Hanover, Pa. Dental Finishing Strip Package.—It has heretofore been the general custom of manufacturers and dealers in dental supplies to put up dental finishing strips loosely in boxes. This arrangement has not proven satisfactory, because when one strip is withdrawn from the box, on account of their roughened surfaces, others cling thereto and are likewise pulled out; for the same reason it is difficult to replace them in the box, while their presence loosely in the cabinet drawers is very objectionable. It is the object of this invention to overcome the above-noted objection by providing a simple and easily manufactured package which will hold the strips in neat relation, and permit the removal of one or more without disturbing the arrangement of the others. To this end, a casing is employed, in which is slidably mounted the strips, their inner ends being secured together to form a head. The head is prevented from being drawn out of the casing by suitable stops formed at one end of the same. When not in use, the strips are placed within the casing and when one is wanted, they are drawn outwardly, so that one or more may be torn from the head without affecting the others.

Joseph P. Adams, Seattle, Washington. Bag Holder.—The bag holder of the present invention is adapted to hold the mouth of the bag open, and in communication with the discharge end of a chute or hopper for filling the bag. It is provided with outwardly extending bag engaging flanges, which have perforations for the reception of impaling pins for holding

a bag on the flanges. The pins are raised and lowered to engage and release a bag, and they enable the latter to be quickly and securely fastened to the bag holder.

Mr. James L. Jackson, Williamsport, Pa. Camera Attachment.—Mr. Jackson has invented an exceedingly simple device for cutting off from a lens reflected light from adjacent objects, thereby permitting only the direct light rays to strike the lens. A clear cut impression upon the sensitive member of a camera is thus obtained. The attachment consists of a tapered tube secured at its smaller end to a camera. The tube consists of a flexible covering arranged over a collapsible frusto-helical frame.

Stephen D. Smith, Orlando, Florida. Machine for Preventing Deposition of Frost upon Vegetation.—The machine disclosed in a patent issued recently to Mr. Smith is a distinct novelty. It is designed to counteract the effects of frost and to thereby protect orange groves, pineries, vegetable gardens, strawberry beds, and in fact vegetation generally from damage by frost. The machine consists of a portable vehicle equipped with a fire-box, a steam generator of novel construction, and spray nozzles from which steam may be projected for the purpose of raising the temperature of the atmosphere adjacent to the vegetation. The nozzles or spraying devices are caused to rotate, so that the projected steam will cover a considerable area instead of being concentrated at one or more points. Practical demonstration has proven the value of Mr. Smith's invention, and its utility is vastly increased by reason of the fact that it is well adapted for general heating purposes as, for instance, the heating of hot houses and the like.

William H. Cox, Iron Mountain, Mich. Draft Rigging.—This invention relates to improved means for mounting draw bars of the type of car couplings in general use, and one of the advantages of the improvement is that it does not require any alteration in the construction of cars. The draft rigging employs tubular telescoped support and draw bar members, and the cushioning springs are housed within the same. The invention is adapted to be readily substituted for the ordinary draft rigging, and when applied to a car will prevent a broken or worn coupling from dropping to the track and wrecking or otherwise injuring cars in rear of it.

Edward Davies, Reading, Michigan. Method of Making Cement Fence Posts. The method of making fence posts of this patent excludes moisture from the posts, and thereby accelerates the hardening of the material and prevents disintegration due to the presence of moisture. The material is placed in a mold and permitted to remain until it becomes hard enough to handle without breaking. It is then subjected to a bath of liquid hydraulic cement which renders the post thoroughly water-proof.

James P. Gordon, Florence, Colo. Washing Machine.—One of the principal advantages of the present invention is that the clothes and other fabrics being washed are prevented from being worn, torn or otherwise injured by the washing machine, which rapidly and thoroughly effects the operation of washing without rubbing the clothes. The machine is provided with an open work washing cylinder and an open work clothes cylinder, which is loosely supported upon the periphery of the washing cylinder. An open work bag is provided for holding small articles of wearing apparel. The bag is provided with hooks for connecting it with the clothes cylinder.

John Gottbrecht, Montrose, Kansas. Two patents. Anti-friction Bearing and Lubricator.—The anti-friction bearing is particularly designed for supporting heavy shafting intermediate of the ends thereof, and it is provided with means for enabling wear and lost motion to be readily taken up. A vertically disposed wheel bears against the under side of the shaft, and vertically adjustable horizontally rotatable wheels are arranged to receive the journals of the vertical wheel.

The other patent is for a lubricator for maintaining the bearings of vertical shafts normally submerged in a liquid lubricating element to obviate heating of the bearing and gumming of the lubricant. The lubricator is provided with a sectional cup or casing, and means are provided for drawing the sections into engagement with the shaft, which carries the cup or casing.

John M. Holloway, Inventor, Santa Barbara, Cal.; Mary E. Holloway, assignee, same place. Mortar Bed.—This mortar bed is a portable knock down device adapted to be quickly and conveniently set up for use, and capable of being readily taken apart and packed into small compass for transportation or storage. It is composed of a bottom supported upon sills, side pieces arranged on projecting portions of the sills and end pieces located between the side pieces. The mortar bed is securely held together by clamps, which engage the bottom and side pieces.

Daniel S. Waugh, Chicago, Ill. Two patents. Pneumatic hammers. These two patents issued to Mr. Waugh are for inventions in an art which has been marvelously developed within the last few years. It is impossible to estimate the vast number of uses to which these portable pneumatic hammers have been put recently. In general, these hammers comprise a small cylindrical casing provided with an operating handle at one end, and having at the opposite end a tool socket in which a chipping, calking, riveting or other tool is fitted. Within the cylinder reciprocates a more or less solid piston, constituting a hammer operated by pneumatic pressure to strike repeated blows in quick succession upon the inner end of the tool. The two great problems which have presented themselves for solution are, first, the proper control of the motive fluid, and, second, the elimination of the excessive vibration usually incident to the operation of these hammers and exceedingly trying to the operator. The first of these two patents is for a hammer in which the piston or hammer proper constitutes a valve controlling the supply and exhaust of motive fluid to and from the opposite ends of the casing, the vibration being minimized, first, by subjecting the hammer during its initial movement toward the tool to fluid pressure acting against a reduced pressure area, and second by providing a relief port in the hammer for the relief of the compression opposing the hammer during the final portion of its return movement. The provision of this relief port permits the hammer to move back smoothly to its completely retracted position, so that while it is afforded a complete stroke and is cushioned at the end thereof, the objectionable vibration is almost wholly eliminated.

The other patent discloses a hammer in which the motive fluid is controlled by automatically operating valves distinct from the piston. The arrangements for eliminating vibration are similar to those provided in the hammer first described, except that the relief port is formed in the wall of the cylinder instead of in the piston. Both of these hammers are remarkable for their simplicity, and as Mr. Waugh is a skilled mechanic, they will no doubt go into extensive use.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE.**—Patent No. 703,348. Saw Gage and Joiner. Can be used on various sizes of saws without any difficulty. For particulars address Joseph Hrbacek, Bessemer, Michigan. (my)

**FOR SALE.**—A fence wire stretcher. Will sell for cash or trade for real estate. Cut and description on request. Supposed to be worth \$100,000. Address C. W. Hoagland, Gates, Nebraska. (my)

**FOR SALE.**—Patent No. 715,194. Combined Rule and Square. Can use as square or two foot rule. Will mail one upon receipt of seventy-five cents, brass bound, one dollar. P. M. Callahan, Box 248, Denver, Colo. (my)

**FOR SALE.**—Patent No. 716,088, dated December 16, 1902. Match Box. Address, Emil G. Nordblom, East Syracuse, N. Y. (my)

**FOR SALE.**—Patent No. 697,625, dated April 15, 1902. A device for lifting pipes or rods from wells. May also be used to lower pipes into wells. For particulars address, Anton Hogenson, Calmar, Iowa. (apr)

**FOR SALE.**—Patent No. 713,698. Automatic elevator or hoist, designed for elevating or conveying coarse material with wire cable instead of belt. Manufacturers of mining and milling machinery should investigate. Address J. Sewell, 1100 East 5th Street, Anaconda, Montana. (apr)

**FOR SALE.**—Patent No. 688,148. The up-to-date fire place. For neatness, simplicity, durability, and economy, I claim it cannot be surpassed. For sale or lease on royalty. For particulars address: L. B. Arnold, Hanly, Ky. (apr)

**FOR SALE.**—Patent 714,527, sale or on royalty. November 25, 1902. Superior merit in fertilizer distributors. No clogging or slipping. Perfectly even distribution without the use of safety-board. Address Ernest C. Smith, Hunkley, Ill. (apr)

**FOR SALE OR EXCHANGE FOR LAND.**—Patent Farm Gate No. 610,422. Issued Sept. 6, 1898. State rights for sale, or will place on royalty. Prices low. Address L. C. Tyler, R. D. No. 1, Alexandria, Ohio. (apr)

**FOR SALE.**—Patent No. 713,242, dated Nov. 11, 1902. Anti-Nicotine. A Great Bonanza. Apply to Rickert & Williams, P. O. Box 257, South Milwaukee, Wis. (apr)

**FOR SALE.**—Patent No. 716,510. A new and useful lock designed for mail bags, trunks and chests. Price reasonable. Address Isaiah Wolf, Midway, W. Va. (apr)

**FOR SALE.**—Patent No. 671,498, dated April 9, 1901. Saw Handle Attachment, for blowing sawdust away during operation. Will sell outright or on royalty. Address Emil A. Michalscheck, No. 1610 Crockett Street, Houston, Texas. (apr)

**FOR SALE.**—Patent No. 715,495, dated December 9, 1902. Mail Bag Fastener. For holding the rope of mail bags. Patented in the United States and Canada. Address Merrill & Son, Nora Springs, Iowa. (apr)

Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING CO., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

**"THE INVENTIVE AGE."**

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O. ....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

**FOR SALE.**—Patent No. 712,858. An improved adjustable roller curtain bracket. Something new in curtain fixtures. Can be adjusted to hold varying widths of rollers. Can be set to desired place without trouble or worry. Address Joseph F. Seibert, 1124 Church Street, Reading, Pa. (apr)

**FOR SALE.**—Patent No. 708,272. Spring Vehicle Brake. Address James A. Tautphaeus, Sappington, Mo. (mch)

**FOR SALE.**—Patent No. 528,571. Automatic shutter bowing hinge. Holds shutter in any position desired without use of ribbon. Has other improvements. Will sell county, state or entire right at low rate. Address Harry Peopples, Box 92, Mount Joy, Pa. (apr)

**FOR SALE.**—Patent No. 715,636. Pencil or pen holder made out of one piece of wire. Fastens to top vest pocket. Sells on sight. Address J. R. Booth, Sault Ste. Marie, Ontario, Canada. (apr)

**FOR SALE.**—Patent No. 712,720, November 4, 1902. Air Bed, Cushion, etc. Sanitary, economical and convenient. Simple, cheap, yet strong and durable. Especially convenient for soldiers, hospitals, etc. Will sell outright. Address Fannie L. Richardson, Corinth, Miss. (mch)

**FOR SALE OR EXCHANGE.**—Clipper Curry-comb. Will clean an animal better than any other. Patented in United States October 14, 1902, No. 711,423. Canada, December 9, 1902. Price \$20,000 for both countries. Address Frank L. Greene & Bro., Wellsboro, Pa. (mch)

**FOR SALE.**—Combination tie plate and rail bracer. Great tie saver. Should be used on all curves. For particulars address A. J. Flynn, 722 E. 137th St., New York, N. Y. (mch)

#### WANTED.

**WANTED.**—Agents wanted everywhere for the World's Only Egg Separator. Necessary household article, sells on sight. Sample 10 cents. Send for particulars. The Bell & Bacon Mfg. Co. sole owners and manufacturers, Railroad Bldg. Denver Colo. (my)

**WANTED.**—A fully equipped Machine Tool Company wishes to add to their line of goods. Also solicit metal pattern work, perfection of models, jobbing, &c. Address C. N. Grace, 341 W. 20th St., Erie, Pa. (mch)

**WANTED.**—Partner wanted with capital to manufacture Nut Wrench patented December 31, 1901, patent No. 690,187. Best wrench for quick work. Address Jesse L. Robison, Cross Fork, Pa. (apr)

## CAPITAL

Can be secured for the right kind of inventions. Perhaps we can help you.

**W. C. & F. D. BURGESS,**  
NEWARK, NEW YORK.

**The Manhattan**  
**Typewriter,**

**Guaranteed to be of the**  
**Highest Grade.**

**NOT IN THE TRUST.**  
**PRICE \$50.**

**JOHN C. PARKER,**  
619 Seventh St. N.W., Washington, D. C.

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY

= = = **MAGAZINE**

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

**A JOURNAL OF QUALITY.**

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. **The ARMY AND NAVY MAGAZINE,** Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00



## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America. For rates, address—

**The Railway and Engineering Review,**  
1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

**SUBSCRIPTION \$2.00 PER YEAR.**

**E. F. OCHS & BRO., Publishers,**  
Send for sample copies. ALLENTOWN, PA.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

**FRED. B. NICHOLS & CO.,**

913 E St., N. W.,  
Wholesale Stationers, Washington, D. C.

## Magic Rheumatic Cure!

It absolutely does cure. It is not a cheap remedy but it is a cheap cure. Mark the distinction! There are a thousand remedies to one cure. This is a CURE. It costs \$2.00 a bottle, and is worth \$20.00 to any sufferer. All good druggists sell it. If not, don't let them "stuff" something else on you. We will send prepaid for \$2.00. Book free. Agents wanted.

**MAGIC CURE CO.**

R. 331-315 Dearborn St. Chicago.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

**ELEGANTLY CLOTH BOUND.**

**GOLD STAMPED.** \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— **The Inventive Age Pub. Co.,**  
918 F St., N. W. WASHINGTON, D. C.

**E. C. WILEY,**  
**Mechanical** = = =  
= = = **Engineer,**  
Office 811-1-2 Main Street,  
Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.

## RIPANS



The simplest remedy for indigestion, constipation, biliousness and the many ailments arising from a disordered stomach, liver or bowels is Ripans Tablets. They have accomplished wonders, and their timely aid removes the necessity of calling a physician for many little ills that beset mankind. They go straight to the seat of the trouble, relieve the distress, cleanse and cure the affected parts, and give the system a general toning up. The Five Cent packet is enough for an ordinary occasion. The family bottle, 60 cents, contains a supply for a year. All druggists sell them.

## THE AMERICAN HAY, FLOUR, AND FEED JOURNAL.

The Recognized Organ of the Dealers in Hay, Flour and Feed. A Magazine that brings the Miller and Shipper in touch with the Dealer. It shows the Dealer where to buy his Goods.

**PUBLISHED MONTHLY.**

Subscription price, 50 cents a year in advance. Sample copy sent on application.

**SHIPPERS & RECEIVERS PUBLISHING COMPANY.**  
Produce Exchange. New York City.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, MARCH, 1903.

### Can Patent Monopolies be Controlled?

The decision of the Supreme Court of the United States in the case of E. Bement and Sons vs. The National Harrow Company, printed in another column of the AGE, is of extraordinary interest, involving as it does a number of questions which are entitled to grave consideration.

In that case the validity of certain contracts entered into by the complainant and the defendant was the only Federal question raised for the consideration of the court, it being contended that said contracts were void, not only as against public policy, but also that they were a violation of the Federal statute (the Sherman law) upon the subject of trusts and illegal combinations. The court held that the contracts were not in violation of the act of Congress prohibiting combinations in the form of trust or conspiracy in restraint of trade, and re-affirmed the doctrine that a patent is a monopoly recognized by the Constitution, and that an owner of a patent has the right to sell it or to keep it, to manufacture the article himself or to license others to manufacture it, to sell such article himself or to authorize others to sell it, and he is not bound to use his discovery himself nor to permit others to use it. The general rule as to patents is absolute freedom as to the use or sale of rights under the patent law. The very object of these laws is monopoly, and with few exceptions any conditions imposed by the patentee, and agreed to by the licensee, as to use or sale of the article will be upheld.

The court furthermore held that notwithstanding the issuance of a patent by the Federal government, the sale of patented articles may be controlled within the several states by a legitimate exercise of their powers over their purely domestic affairs, and that such action is not an improper interference with the right conferred by the patent.

The court cited an instance where

a patent had been granted on an improvement for burning oil. It was condemned by the State Inspector of Kentucky as being unsafe for illuminating purposes, and it was held in that case that the enforcement of the statute was within the proper police powers of the state, and that it interfered with no right conferred by the patent.

The difference between the United States law as interpreted by the Supreme Court in the case under discussion, and the laws of foreign countries, is very plain. In countries like Canada, France, Belgium, Germany, Austria, Italy, Norway, Sweden, Russia, and Spain, there is a provision in their laws which requires a patentee to work his invention within a certain stipulated period, varying from one to three years after the issuance of the patent. In Great Britain, and in a number of the English colonies, their laws stipulate that if the patentee fails to work his invention sufficiently to supply the demand, any one may petition the proper authorities to require the patentee to grant a license to others, and if the patentee refuses to make the grant the government itself may do so.

This requirement as to compulsory license has some points in its favor. At the same time, it is believed that there are many advantages in favor of the American system, which permits a patentee, when he secures a patent on his invention, to monopolize it in the truest sense of the word.

The decision is well worth careful perusal, and a complete copy of the same can be obtained from the Commissioner of Patents by ordering a copy of the Gazette of October 28, 1902.

### What Marconi has Done.

When Marconi announced a year ago, that he had received signals at St. Johns, Newfoundland, from Poldhu, England, the well-informed admitted that the possibility of sending wireless messages had been realized. To the expert it seemed plain. It was simply a matter of power, and with a proper increase of power at the sending station, and under suitable atmospheric conditions, messages could be transmitted and received across the ocean.

The latest news from Marconi confirms the first impressions. This clever inventor has not been willing to spend his time in selling shares of stock in a doubtful enterprise, but has gone right along perfecting his plans, and now appears to have reached the goal.

On the twenty-first day of December, Marconi announced to the world that intelligent messages had been received at Cape Breton, Nova Scotia, from Poldhu, England, and moreover, that the station at Cape Breton had succeeded in sending messages which had been received at Poldhu.

A late press dispatch indicates that messages in Italian had been sent from this country and received in England, although the operators at the other end of the line had no acquaintance with the Italian language, all of which demonstrates that

the system can be operated reliably under present conditions.

While the results that have been accomplished do not determine the commercial value of this system, for it yet remains to be settled as to whether or not wireless telegraphy can compete successfully with the present systems, still, no one can question the statement that Marconi is deserving of much praise for his continued effort and hard work. What seems the more creditable is the fact that he has not attempted to exploit his invention to his own advantage, by attempting to ensnare the public into purchasing shares of stock in an enterprise not yet reduced to a practical basis.

The idea of sending messages by the wireless system across the ocean is not new. Marconi was not the originator of this idea. The construction or means which he employs for carrying out the system is, however, novel, as is shown by the various patents which have been issued to him.

However, until the system has been reduced to a commercial basis, so as to compete successfully with the two companies now operating the cables across the ocean, the public generally will not be benefitted by the work of the inventors along this line. Much remains to be done; but if Mr. Marconi advances within the next year, as rapidly as he has already done, it will not be long before the public will be sending wireless messages to Europe.

### Important Changes in English Patent Law.

Certain proposed amendments of the English patent law were commented on in the May issue of the AGE, and we have recently received advices that the patent law amendment bill introduced into the British Parliament in the early part of 1902, has now passed all the stages, has received the Royal Assent, and has become a law, and will be operative from and after January 1903. The provisions of the Act should receive the careful attention of inventors and patent attorneys. They may be grouped as follows:

*First*—A search will be made with regard to the novelty of the subject matter of all applications for patents accompanied by complete specifications.

*Second*—Only complete specifications published within fifty years from the date of the application under consideration will be examined, and specifications published over fifty years ago will not be regarded as anticipations.

*Third*—The applicant's attention is to be drawn to any alleged anticipatory patents with a view to the amendment of the application, so as to avoid including old matter in his claims.

*Fourth*—Should the applicant fail to withdraw the application or amend the specification of his application to the comptroller's satisfaction, the latter may order that a reference be made in the said specification to any prior patents, which in his opinion may conflict, by way of notice or warning to the public. The patent will then issue.

*Fifth*—An appeal shall lie from the comptroller's decision to the law officer.

*Sixth*—An additional Government fee, not exceeding one pound, will be

imposed to cover cost of search, and shall be payable on the sealing of the patent.

*Seventh*—The period of provisional protection, now nine months, will be reduced to six months.

*Eighth*—Any interested person may present a petition to the Board of Trade of London, alleging that the reasonable requirements of the public with respect to the patented invention have not been satisfied, and praying for the grant of a compulsory license, or, in the alternative, for the revocation of the patent.

*Ninth*—If, upon consideration by the Board of Trade, and failing an arrangement between the parties being arrived at, the Board of Trade is satisfied that a *prima facie* case has been made out, they shall refer the petition to the Judicial Committee of the Privy Council, and if the Board is not so satisfied, it may dismiss the petition.

*Tenth*—Where it is proved that the requirements of the public are not satisfied, the Judicial Committee may order the patentee to grant licenses on such terms as they may think just, or if they are of the opinion that the requirements of the public will not be satisfied by the grant of licenses, they may revoke the patent.

It is, however, provided that no order of revocation shall be made before the expiration of three years from the date of the patent, nor will the patent be revoked if the patentee is able to give sufficient reasons for his default in working the same.

*Eleventh*—If the patent is worked, or the patented article manufactured exclusively or mainly outside the United Kingdom, then, unless the patentee can show that the reasonable requirements of the public have been satisfied, the petitioner shall be entitled either to an order for a compulsory license, or, subject to the above proviso, to an order for the revocation of the patent.

*Twelfth*—An order of the Judicial Committee granting any license under this section shall, without prejudice to any other method of enforcement, operate as if it were embodied in a deed made between the parties to the proceeding.

*Thirteenth*—The provisions relative to compulsory licenses shall apply to patents granted *before as well as after* the commencement of this act.

Restricting the search to fifty years back is rather an odd provision of the law; for under this plan, patentees could obtain a valid patent from the English Patent Office on something patented over fifty years ago, provided that no patent issued at a later date could be cited as an anticipation. Still, the fact that a search will be made as to the novelty of the subject matter of the application, will go a long way towards making the patent more valuable to the patentee.

We do not understand that any application will be rejected, but that if an applicant declines to amend his application in view of the citation of the Comptroller, the patent will be issued, and there will be printed in his specification a reference to prior patents which the Patent Office thinks are anticipations of the whole or part of his invention.

The bill is an important advance, and while it will involve an addition to the cost of obtaining English patents in the future, it is believed that American patentees will not object to the extra charge, when the increased value of the patent, due to the search made by the English Patent Office, is taken into consideration.

We shall watch the operation of this novel law with much interest, and hope it will stimulate other countries to adopt the "American plan" of an examination as to the novelty of all applications.



## SCIENTIFIC

## PROGRESS.

## An Electric Motor Dredge.

A dredge operated entirely by electric motors has been patented by Mr. Ephraim Chaquette, of New Rochelle, New York. The invention relates particularly to that class known as clam dredges. The usual boat or float is employed and upon the same is built a suitable frame. At one end of this frame is pivoted a horizontally swinging carrier arm, the free end of which is supported upon a track located upon the frame. A motor mounted upon the carrier arm is provided with a pinion that meshes with a rack secured to the frame, and as a result the arm can be swung through a lateral space of about fifty feet, or from side to side of the dredge float if but one arm is employed. The inventor, however, preferably provides two which are entirely separate from each other and are independently operated. Upon the free end of the carrier arm, and projecting beyond the end of the float is a clam frame, from which is suspended a discharge funnel or chute that conducts the material from the clam frame to a receiving scow. The clam frame is supported by ropes running over pulleys, one of which is journaled upon the clam frame, the other being arranged at the pivoted end of the carrier arm, where suitable counterbalances are provided. The ropes or cables are operated by a suitable motor having sufficient power to raise the clam when filled. The clam frame, as usual, is constructed of two sections pivoted together and having upstanding arms provided with racks. The sections are supported on a triangular frame which constitutes a support for an electric motor having gears meshing with the racks, this motor thus serving to open and close the clam frame and being movable therewith. A novel arrangement of electrical connections and switches is used in connection with this motor, so that when the clam frame is submerged in its open position, current is automatically supplied to the motor which is thereby operated, consequently closing the clam frame. The clam frame is then elevated, and when it reaches its highest position, the motor is again automatically operated to open it, so that the contents are discharged into the chute.

## New Use of Wireless System.

It is now proposed to employ the "wireless" system of electrical transmission for the purpose of operating vessels, torpedoes and the like from a distance. A patent has just been obtained by Mr. Lida Wilson, of Brooklyn, New York, on mechanism of this sort. The mechanical operations may be of various kinds—as, for instance, the operation of machinery upon a vessel for the purpose of propelling and directing such vessel and to perform various other functions, also mechanism for closing an electric circuit to ignite a torpedo or explosive charge upon a floating vessel or in a subaqueous or subterranean mine.

The impulse transmitted to a wireless receiver of electricity would in such case be used to initiate the operation of the electric circuit required to produce the igniting spark. The wireless transmitter, attuned to operate in unison with such wireless receiver, may be upon a floating vessel or upon land.

Where a number of mechanical operations are to be performed, a series of the wireless receivers may be employed to initiate the movements of the several mechanism, and a corresponding series of wireless transmitters, each synchronized and attuned in unison with one of said wireless receivers, would be used to initiate such mechanical operations independently, so that each receiver can only be influenced by a transmitter attuned in sympathy with it. In many cases the various mechanisms may be advantageously actuated each by an electric motor and storage battery carried upon the vessel, and the movement of each motor and the resulting operation is initiated by means connected with the wireless receiver of electricity upon the vessel. The ignition of an explosive charge, whether upon a craft, torpedo, or in a mine, is correspondingly effected by the use of a wireless receiver to close an electric circuit and direct a spark into the charge to explode the same. A series of motors to perform different functions upon the same craft may be set in operation by a series of wireless receivers constructed or attuned differently one from another, but each adapted to operate synchronously in unison with a special one of a corresponding series of wireless transmitters located at the same or at different distance stations, so that each receiver can only be influenced by a transmitter attuned in sympathy with it. The transmitters may be connected electrically with a kite or mast, which may be placed, vertically, inclined, or horizontally.

## Electricity in the Kitchen.

The very latest application of electricity is to cooking. M. Moissan, of Paris, has been making experiments in raising heat by electricity. He has succeeded in inventing an electric crucible in which very great heat is generated, and the most intractable substances, that hitherto had defied analysis, are driven off into vapour; but more moderate heat can also be obtained for ordinary purposes. In fact, it is a mere matter of arrangement whether we get light or motion or heat from the electric current. If we choose heat, we can have it, and we can use it as we desire, to smelt metals or to cook our dinner. An electric oven has been invented, in which electricity both turns the spit and roasts the joint. The fireplace has been turned into a small electric furnace, from which the heat radiates just the same as if it were a coal-fire. Vessels have been made for cooking purposes, with an outer and an inner skin, the interval between the two skins being filled with a white metal which is heated by a current of electricity. In this way water can be boiled and food cooked. There are three degrees of heat according to the will of the attendant. The vessels are provided with binding screws that connect them with the current in a moment. It is

impossible to exaggerate the importance of this invention. In a few years we shall be turning on our room-fires for heating just as we now turn on the gas for lighting. Our cooking will be done without dust or smoke; and by being able exactly to regulate the intensity of the heat, we shall also be able to cook a steak to our entire satisfaction. At the breakfast-table the coffee may be made before our eyes, while soups and other preparations can be allowed to simmer any needed time, with the certainty that the fire will neither become too hot nor go out altogether. There is hope for scientific cookery under the conditions of the coming time! The housewife's labours will be lightened, and her husband's temper will remain serene. Already the applications of electricity as a heat producer are numerous, and they are increasing every day. Among the first so to use it were tailors, who now employ it to heat their irons; and as these were formerly heated by gas, the workshops must now be healthier places to work in. The electric current, it seems likely, will be used extensively for many similar purposes.—*Chamber's Journal.*

## A New Fireproof Material.

In these days when cheap and fireproof building materials are so much sought after, a new material is being extensively pushed, which is worthy of the praise it is receiving. Uralite is composed of asbestos fiber, with a proper proportion of silicate and bicarbonate of soda, and a small amount of chalk. It is supplied in various finishes and colors, according to its ultimate purpose. In a soft form, the sheets are like asbestos board; harder, they resemble finely sawn stone and have a metallic ring. Uralite can be supplied in a plastic form for pipe covering, if required. The principal advantage of the material is undoubtedly its fire-resisting property. It is a nonconductor of heat and electricity, is practically waterproof (and may be made entirely so by paint), and is not affected by atmospheric influences, nor by the acids contained in smoke in large towns, which rapidly destroy galvanized iron.

The new material is particularly suitable for brewery stores, malt bins, etc., and also for cold storage of meat and of other perishable articles. A light studding with sheets of uralite on both sides, and the intervening space filled with silicate cotton or other convenient packing material, forms a most complete and inexpensive insulator. The material makes a successful joint for steam piping, and is certainly preferable to wood for boiler lagging.

Uralite has the further advantages that it can be cut by the usual carpenters' or woodworking tools; it can be painted, grained, polished, and glued together like wood; it can be veneered to form paneling for walls, or partitions for ships' cabins or for railway carriages; it does not split when a nail is driven through it; it is not affected when exposed to moisture or great changes of temperature; and it can be given any desired color either in the process of manufacture or afterwards. It is the invention of a Russian artillery officer and chemist, named Imschenetzky.

The process of manufacture is akin to that employed in paper making, and the same class of machinery is adopted

at various stages. The process commences in what is known as a "preparation building," where the crude asbestos is first of all "teased" out and freed from sand and other foreign substances. It is carefully graded and separated and passes onto edge runners, where a small portion of whiting is added to prevent grinding rather than the loosening of the fibers which is desired. From the edge runners it is conveyed by elevators to a floor above, where it is fed into a Krupp disintegrator which further loosens the fibers. It is again separated by air blasts and by sieving, and is then ready for the next stage.

In another building, the asbestos is mixed with an equal weight of whiting, if white uralite is being made; or if gray or red uralite is needed, this is replaced by carbon black, or red oxide. The whiting is first reduced to a cream by beating it up with revolving paddles in a mixer. This is passed through a sieve for the removal of accidental impurities, and thence into a "hollander." The asbestos is next added, the usual charge being 5½ cwt., and then the coloring matter. The whole is worked up into an emulsion by revolving screws and beaters, for a quarter of an hour or so, and there is a further separation to remove any sand which may have hitherto escaped detection.

The uralite pulp then passes to a machine designed on much the same lines as that employed in making paper boards. The pulp is delivered over riffle boards onto an endless revolving blanket, and passing through a series of rolls is partially dried and compacted. It then passes onto a revolving drum at the end of the machine, on which some fourteen or fifteen thicknesses are deposited before the required thickness is attained, this point being signalized by a flash from a red incandescent lamp above.

During the process of winding onto the drum, a solution of sodium silicate, with an amount of sodium carbonate insufficient to permit of the immediate deposition of the silica, is passed over the successive fibers of asbestos, and serves as an adhesive.

The large sheets, as they are taken from the drum in their pliable state, are quickly cut to smaller ones, measuring 6 feet 2 inches by 3 feet 1 inch. These sheets are piled up, alternating with sheets of wire gauze or sheet iron, to a height of about 40 inches. The pile is then placed under an hydraulic press and the pressure slowly increased, so that at the end of half an hour it is equivalent to about 200 pounds per square inch. This is maintained for one and one-half hours, and the pile is then left to harden for twenty-four hours, after which the sheets are removed to go to the storing rooms. Here they are placed vertically in racks on trucks, and pass through a series of stoves with graduated temperatures. The stoves are gas fired. They are then steeped in a solution of sodium silicate, washed, left to dry, and again passed through a stove, after which they are steeped in a solution of sodium carbonate, and washed and dried as before. These subsequent operations are repeated as often as required for the final hardening of the sheets, and the entire process occupies several days. The sheets are stacked for some days and again passed through the stove, being then ready for use, though like timber, they are the better for a little seasoning. The sheets of uralite thus produced are found to be uniform in thickness, three thirty-seconds of an inch being the standard.



## THE UTILIZATION OF WASTES AND BY-PRODUCTS IN MANUFACTURES.

WITH SPECIAL REFERENCE TO THE DECADE OF 1890-1900.

By HENRY G. KITTREDGE, of the Census Bureau.

### PART VII.

#### WOOLEN INDUSTRY.

The great importance and growing appreciation of the solvent process of cleaning wool and preparing it for dyeing and spinning permits of special and more extended observations. Scientists and technical experts who have studied the wool fiber are unanimous in the opinion that it should be freed from its fat by means of volatile solvent, and not by the use of soapy and alkaline solutions, as has been heretofore the universal practice.

A number of patents have been granted of late years for cleansing wool by some solvent process. Among the important ones are those based upon the patents of Emile Maertens, of Providence, R. I., all of which relate to methods of treating wool and refining wool fat. The apparatus employed relates essentially to the economical removal and saving of the solvent adhering to the materials after their extraction, and particularly to the economical and safe treatment of wool with volatile solvents.

The process employed for degreasing wool is that of treating the wool in close digesters with the volatile solvents until a complete extraction is effected. One of the principal features of the process is the employment of compressed gas as a forcing or motive power to circulate the solvent through the wool under treatment. It is used to press the liquid solvent out of the wool as well as to blow out of it such solvent as has not been removed by pressure. It is also used as a heat-carrying medium to the wool and as a solvent vapor-carrying medium from the wool. It is furthermore used as an atmosphere wherein to carry on the extracting operation, both for covering the solvents in the reservoirs and for taking the place of the solvent removed from any part of the apparatus, and thus prevents the ignition of the solvent vapors by any electric or other spark which might accidentally be communicated to it. Since the gas is always moved in a closed circuit, it prevents the loss of solvent vapors, and can be used repeatedly without limit. It may be explained that the gas referred to by the inventor is an inert gas, or one which does not form explosive compounds with the vapors of the solvent used, or with atmospheric air.

The early attempts to carry on the process of degreasing wool by means of volatile solvents were none of them successful from a commercial standpoint, although the rationality of the process was fully demonstrated in almost every instance by the superior condition of the wool thus treated. The problem was a very complex one to solve, requiring considerable mechanical engineering skill, knowledge of the wool fiber, of chemistry, due regard for the healthfulness and safety of the operation, and the blending of all these requisites into a system, the result of which would show a saving which could be expressed in dollars and cents.

In 1895, a plant for treating wool by the "solvent process" was put in operation by the Arlington Mills, of Lawrence, Mass., and was the first plant of its kind in the world that was commercially and technically successful. This plant has the capacity of degreasing 50,000 pounds of wool every ten hours, and has been run to its full limit ever since it was started.

After an experience of six years with the solvent process, the Arlington Mills are now building a new plant to treat wool by this process which will have the capacity of degreasing from 200,000 to 250,000 pounds of wool every ten hours.

The saving effected by the "solvent process" to establishments that degrease and work their own wool for worsted purposes can be expressed in round numbers as averaging 2 cents per pound, figured on the greasy wool. This saving is made in the cost of the soap, which is entirely dispensed with by the new process: in a greater yield of the wool fiber since none of it is dissolved by soap and alkali; in a larger proportion of *top to noil*, because the wool, being free from any felting, cards and combs freely without breaking the fibers or the making of nibs; in a larger production on cards, combs, drawing, and spinning machinery; in the superior softness and appearance of the finished product; in the wool fat recovered, and in the potash recovered. The cost of the degreasing operation, including labor, solvent, power, interest, depreciation, etc., is, it is estimated, more than covered by the soap saved.

The average amount of fat taken out of such wools as are worked in the United States is 15 per cent, which at the minimum price of 3 cents per pound represents 45 cents on every 100 pounds of wool degreased. If to this is added also the value of the carbonate of potash recovered from the rinsing waters, which on an average amounts to 25 cents net per 100 pounds of greasy wool treated, we have 70 cents as the average minimum value of the by-products recovered from every 100 pounds of raw wool, or seven-tenths of a cent per pound of wool treated.

It is safe to say that from two to three million dollars worth of wool fat and potash are run down the streams and wasted annually in the United States. If this wool fat instead of being wasted were recovered, refined, or separated into its constituent parts, its value would increase at least fivefold, and its uses would multiply. As the freighting expenses from some wool-producing districts to the mills or wool stores are often as high as 2 cents per pound, and average more than 1 cent per pound for that part of the wool clip which is consumed in the Eastern and Middle states, and as the average shrinkage of the wool clip is 60 per cent, and some wools shrink as high as 80 per cent, it will readily be seen that in some cases these freight charges amount to 10 cents per pound on the clean wool, and that the average is 2½ cents per pound on clean wool. By establishing degreasing plants at the principal Western shipping points, millions of dollars worth of wool fat and potash could be recovered annually, and from 60 to 80 per cent of the freight charges, amounting to several millions of dollars more, could also be saved. Such a plan, if it were feasible, would have the further advantage of putting the wool upon the market absolutely clean, free from further shrinkage, and in the most perfect condition for working. In having wool cleaned at the shipping points, some system of grading or sorting the wool according to its qualities would necessarily have to be established in order to meet the requirements of manufacturing.

More progress has been made in the United States in the practical employment of the solvent process than in any

other country. Plants have been recently erected in Belgium and Saxony, but not on so large a scale as exist in this country. The chief opposition to them is that of first cost, and the revulsion of manufacturers to the giving up of old methods. The cost of erecting a suitable plant is undoubtedly a serious obstacle in the employment of the solvent process, and to bring the process within the scope of the industry this obstacle may have to be removed.

The application of wool grease in the leather industry is familiar. Some experiments performed in Europe and described in the Journal of the Society of Chemical Industry in its issue of February 28, 1898, in "stuffing" a number of samples of leather with a mixture of wool grease and tallow, showed that the neutral wool grease penetrated the leather better than other fats of the same consistency; that it left no sticky touch or ill odor; and that, in the case of chrome-tanned leathers especially, it gave a very good color.

Wool grease under the name of "degras" is very largely used for stuffing leather. The term "degras," as employed in the trade in the United States, and as used in paragraph 279 in the customs tariff—where it is spoken of as brown wool grease—applies to grease extracted from the wool of sheep. In genuine use, however, the term "degras" is applied to oils and greases used by tanners without any special distinction, including what is known as "sod oil." Sod oil and wool grease have entirely different constituents as well as characteristics, and hence should be easily distinguished. Wool grease is extracted from the wool of sheep. Sod oil is expressed or extracted from leather which has been curried with oils, particularly fish oils. Sod oil has no relation to wool grease in its derivation, but is related to it in its use; that is for the currying of leather. Sod oil contains a resinous substance (not a resin) known as *degras* former, which is characteristic of sod oil. No other oil or grease (and this includes wool grease which is, scientifically speaking, an animal wax and not a grease at all) contains this *degras* former, which is therefore characteristic of sod oil. Originally sod oil was called *degras*. Later, the term "degras" was made by the American oil trade to embrace wool grease, and was adopted less extensively by the English. The term has therefore come to embrace two substances, dissimilar in constitution, source, and chemical constants.

The most useful by-product of the woolen industry is undoubtedly woolen rags that may be reconverted into wool. Before these rags were used for this purpose, they were either thrown upon the waste heap to become manure, or collected and used for the production of prussian blue and an inferior grade of paper. No waste of this kind is now permitted, but every woolen rag, in whatever form it may appear, unless completely worn out, is reused in manufacture, to appear again in clothing. Such rags are used and reused until there is absolutely nothing left of them that can be utilized, when they are mixed with hoofs, horns, and the blood from slaughterhouses, and melted with wood ashes and scrap iron for material out of which the beautiful prussian blue is made.

Shoddy has been a part of the woolen manufacture since the beginning of the nineteenth century, and its use is one of the necessary developments of the art of manufacturing, as, were it not for the supply from this source, there would not be a sufficient amount of raw material to meet the demands for clothing, except at very much increased prices over those that exist to-day.

Shoddy is not woolen rags ground to powder, but rags that are picked, leaving a good staple suitable for spinning. Some of the most substantial goods that are made, doing serviceable work for a number of years, con-

tain a proportion of shoddy mixed with wool.

The largest amount of shoddy is utilized in the woolen industry of Great Britain; next to which comes that of the United States, where, in 1900, about 75,000,000 pounds were consumed, mostly in the manufacture of woolen fabrics, very little going into worsted fabrics, and that little placed upon the back of the goods, the worsted appearing upon the face.

In recent years none but all-wool shoddy has been manufactured. During the Civil War and prior thereto much of the shoddy for low-grade goods consisted of that made from rags with more or less cotton in them, especially in the warp. The improvement in the manipulation of rags, particularly those that contain more or less vegetable matter, as cotton, is due to the methods of destroying the vegetable material by means of acids and high temperature, both of which are necessary. These methods come under the general head of what is known in the trade as "carbonizing," which term applies strictly to the destruction of vegetable substances without essentially affecting the manufacturing qualities of the wool fiber. The shoddy thus produced goes under the general trade term of "extract," meaning simply that the wool fiber is extracted from its impure mixtures.

The acid commonly employed in carbonizing rags and making "extract" is sulphuric acid, in which the rags are allowed to soak for a short period of time and then subjected to a heat of from 200° to 210° in a close chamber, when the rags are removed and the acid neutralized by an alkaline bath, after which they are dried and shaken, the latter process converting all of the vegetable matter into dust. The rags, thus left with nothing but pure wool, are then sorted, picked in a machine known as the "shoddy picker," and otherwise treated in the same manner as original "all-wool" rags. The shoddy, or extract, that is thus made, is absolutely clean and free from all deleterious matter, without the slightest possibility of conveying disease germs, and, in this particular, is freer than the wool obtained from many countries in the tropical and semi-tropical parts of the world. There is a process of carbonizing rags in which the wet system (that of submerging the rags in a sulphuric acid bath) is employed. The acid used for dry carbonization is generally hydrochloric. There have been several patents taken out for the treatment of the rags by this process.

In 1896 an English patent was issued for an improved apparatus for carbonizing rags by the hydrochloric acid process, which, if allowed to act on the rags when perfectly dry, does not alter their color. Where the retention of color is essential, the process is a valuable one, as by the wet process the colors are destroyed. By means of this improved apparatus the rags are placed in a perforated drum fitted radially with arms which do not reach quite to the center. A hollow shaft, which is heated in an adjacent chamber by means of furnace gas, enters at one end. Compressed hot air is allowed to enter the chamber containing the drum with the rags, either by way of the hollow shaft and through the rags, or from the outside into the space surrounding the drum. In this manner the rags are perfectly dried. After the drying, hydrochloric acid is allowed to drop slowly from the funnel through the heated part of the hollow shaft into the drum, where it carbonizes the cotton in the rags.

Preparation of acetone oil and ketones from wool washings is referred to in some of the European scientific journals. A process is suggested for this purpose by making use of the volatile fatty acids contained in the liquid obtained by washing wool. The dry calcium salts of the volatile fatty acids thus obtained are distilled in the usual way, the yield being a mixture of ketones.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued February 3, 1903.

### MECHANICAL PATENTS.

Accumulator mechanism.....M. J. Whitlock  
Acid mordant and making same. Organic.....W. Beckers  
Addition tester.....H. E. Brown  
Adhesive applying apparatus.....A. N. & E. J. Barnes  
Advertising or other purposes. Optical device for.....R. C. T. Evans  
Alarm system. Electric time.....E. T. Ackerman  
Aluminium. Producing.....H. F. D. Schwahn  
Animal trap.....P. A. Whitney  
Asparagus buncher.....P. Brunett  
Atomizer.....S. Hasbrouck  
Automobile steering gear.....A. P. Brush  
Baling press.....F. L. Heinrich  
Ball.....3 pats.....K. V. Painter  
Band cutter.....T. N. Huddleston  
Band cutter and feeder.....J. H. Florence et al  
Battery tank. Storage.....B. Ford  
Bed mosquito bar holder.....M. S. Schayer  
Bed. Spring.....W. F. Ade, Jr  
Bed spring. Woven wire.....E. J. Barcalo et al  
Belt. Apparel.....M. Brueckner  
Belt idler.....W. R. Smith  
Bicycle brake.....A. E. Wahlun  
Bicycle driving mechanism.....J. B. Huss  
Binder.....H. P. Jones  
Binder.....W. G. & H. S. Jones  
Bit stock.....N. R. Thibert  
Blind slot lock.....J. W. Clark  
Boiler.....N. Curtis  
Boilers. Device for maintaining the water level in.....O. Berger  
Book for county records, &c. Abstract.....J. E. Lutz  
Book. Loose leaf.....S. Seemann  
Book. Manifold sales.....H. H. Winslow  
Boot or shoe cleaner.....L. C. Smith  
Boot or shoe trimming machine.....E. E. Angell  
Bottle filler attachment.....A. L. Neubert et al  
Bottle. Non refillable.....W. Flatten et al  
Bottle or jar cap.....J. S. Alston  
Bottles, jars, &c. Protector for.....J. W. Steel  
Bottles or glasses. Packing for.....D. H. Russell  
Box fastener.....C. B. Baldwin  
Brake mechanism.....J. King  
Brick cutter.....B. E. Bechtel  
Brick kiln. Downdraft continuous.....A. Yates  
Brigets. Manufacture of.....E. S. Meade  
Brooches, &c. Safety catch for.....G. W. Washburn  
Brush. Automatic bicycle.....J. M. Peterson  
Brush. Bath.....L. Lanterbach  
Brush cutter.....L. E. Gannett  
Brush holder. Electric.....H. T. Maker  
Buckle. Trace.....J. B. Bunkers  
Buggy top attachment.....E. Walter  
Bulkhead doors. Means for operating.....P. Hoppe  
Burning alarm.....J. Wagner  
Burning liquid fuel. Injector or apparatus for.....J. Holden  
Butter printing machine.....A. Anderson  
Button. Collar.....B. B. Mayer  
Button setting machine.....G. W. Gwinn et al  
Cableway system.....F. H. Lamb  
Cabs. Front sash supporting and operating apparatus for hansom.....W. C. Yelton  
Calculator.....J. M. Steele  
Calipers.....Z. T. Furbish  
Candy crimping machine.....S. Morgan  
Candy dipper.....F. C. Spang  
Cape, blanket, and shelter tent. Combined.....C. Stacey  
Car bolster. Hopper.....J. M. Hausen  
Car brake shoe.....F. R. Spear  
Car. Compartment sleeping.....H. F. Holland  
Car. Convertible dump.....H. S. Hart  
Car coupling.....P. T. Handiges  
Car door. Grain.....H. V. Kuhlman et al  
Car draft rigging. Railway.....G. P. Ritter  
Car. Dump.....2 pats.....H. S. Hart  
Car. Dumping.....E. S. Hart  
Car grain door. Freight.....J. Riley  
Car. Hopper bottom.....I. A. Randel  
Car interlocking center bearing.....J. E. Norwood  
Car operated door. Mine.....A. T. Flint et al  
Car side bearing.....2 pats.....J. E. Norwood  
Car transfer. Suspended.....C. A. P. Turner  
Cars. Radial buffing and draft rigging for railway.....H. H. Sessions et al  
Cars, &c. Side bearing for railway.....C. E. Havens  
Carbid blocks or ingots. Subdividing.....J. Scales  
Carbureter for internal combustion engines.....F. H. Messenger  
Carriage. Tramway.....F. H. Lamb  
Cartridge fuses. Electrical contact for.....C. D. Platt  
Casting and article made thereby.....C. D. Cannon  
Cattle guard.....I. Rimbey  
Centrifugal machine.....J. Laidlaw  
Chair seat.....H. B. Morris  
Check. Closure.....F. L. Rosentreter  
Chimney cap.....T. J. Miquel  
Chisel attachment.....G. W. Parker  
Chlorination barrel.....J. B. Heffernan  
Churn.....J. Burge et al  
Cigar holder and shaper.....S. S. Williamson  
Clock. Electric.....V. & V. Himmer, Jr  
Clutch.....V. T. Payne  
Clutch.....A. R. Patten  
Clutch. Fluid.....B. B. Chandler, Jr  
Clutch. Friction.....T. F. Carver  
Cock. Automatic cylinder.....E. L. Jones  
Cock. High pressure ball.....O. J. Fabian  
Coffee pot.....A. E. Block  
Coffee roasting apparatus.....J. Arbuckle  
Coin counting device.....H. Goetze et al  
Comb holder and cleaner.....L. F. Ferrell  
Combing machine drawing off mechanism.....W. B. Lee et al  
Compressor.....W. J. Francke

Condenser. Steam.....W. Irving  
Conduits. Construction of underground.....T. E. Devonshire  
Conveyer.....A. D. Shaw  
Conveying and cooling apparatus.....K. F. Snow  
Cooking utensil.....P. J. & E. H. Gates  
Copper matte into metallic copper. Converting.....G. Mitchell  
Copy pad.....T. B. Ferguson  
Copying press.....H. L. Davidson  
Corn snapping, husking, and fodder shredding machines. Feed mechanism for.....J. O. Thompson  
Couch and chest. Combined.....G. A. Alger  
Couch and folding bed. Combined.....D. T. Owen  
Crate. Folding.....A. A. Smith  
Crate. Shipping.....C. O. C. Leigh  
Crate. Shipping.....D. T. Shocklin et al  
Crupper former.....J. B. Bastian et al  
Cultivator.....G. K. Spitzenberg  
Cultivator attachment.....W. L. Schmidt  
Cultivator. Disk listed.....S. D. Poole  
Cycles, &c. Driving gear for.....B. R. Avery  
Dental crowns. Manufacture of.....E. V. Williams  
Dental matrix retainer.....J. Mills  
Desk shelf attachment.....A. J. Throm  
Diaper. Infant's.....P. E. Kent  
Dilator.....W. E. Minor  
Dish cleaner.....M. D. Colbath  
Disinfecting apparatus.....J. W. H. & E. R. Williams  
Display package for powder, shot, &c.....C. E. Roberts  
Document holder and exhibitor.....C. C. Lee  
Doffer guard.....J. Kilburn  
Door catch and lock.....J. L. Zesiger  
Door operating machine.....R. R. MacDonald et al  
Door operating mechanism.....G. T. Warwick et al  
Door sill.....W. O. & F. H. Jewell  
Dough cutting and weighing machine.....H. P. P. West  
Draft equalizer.....H. J. Zempel  
Draft equalizer.....W. A. Campbell et al  
Draw gear and buffing apparatus.....J. H. McCormick  
Dredging and excavating machine.....J. J. Conlin  
Dress shield.....D. Basch  
Drill shaper and sharpener.....J. Retallack  
Drilling machine.....E. M. Couch  
Driving mechanism. Yielding.....C. P. Sester et al  
Dumb waiter.....J. E. Ortner  
Dust pan.....C. W. Hopkins  
Electric accumulator plate.....A. Bainville  
Electric battery.....2 pats.....H. Halsey  
Electric brake.....F. E. Case  
Electric condensers. Manufacturing.....J. A. Wotton  
Electric furnace.....H. N. Potter  
Electrical distribution system.....J. L. Creveling  
Electrical purposes. Liquid resistance switch for.....J. H. Wooliscroft  
Electrolytic apparatus.....4 pats.....C. J. Reed  
Electrolytic cell.....R. Grisson  
Electrothermally treating materials. Apparatus for.....H. Maxim  
Electrotyping. Machine for oxidizing matrices for.....C. M. Oliver  
Elevator door operating device.....J. L. Kail  
Elevator safety appliances. Electric system for.....G. Hail  
Elevator safety device.....E. H. Price  
Elevator shaft damper.....J. A. Craig  
Emergency brake. Safety.....W. T. Sears  
Engine lubricator. Gas.....H. Morningstar  
Engine stroke varying mechanism. Explosive.....A. F. Parks  
Engines. Vaporizer or carbureter for explosive.....H. W. Tuttle  
Envelope opener or paper cutter.....W. O. Thompson  
Exhibitor.....A. G. & D. H. McCulloch  
Expansion bolt.....W. C. Boone  
Explosive engine.....J. Willoughby  
Eyeglass nose guard.....A. G. French  
Eyelet machine.....I. W. Giles  
Eyeletting machine.....G. Knight  
Fabric marking machine.....A. J. Schmiedl  
Fan attachment.....W. C. Norman  
Farrier's knife.....P. E. Heller  
Feed box.....W. R. Howard  
Fence. Hedge.....M. Neil  
Fence post.....F. E. Gregory  
File binder.....E. A. Sharp  
Filter and extractor press.....J. G. Crossman  
Filter. Oil.....A. G. Norcutt et al  
Fire alarm apparatus. Automatic.....H. Plowman  
Fire and burglar alarm.....I. S. Bunker  
Fire escape.....L. Casanova  
Fire escape balcony. Movable.....M. L. Cronin  
Fire extinguisher and alarm. Automatic.....A. D. Loffler  
Fire extinguishing compound.....J. B. Miller  
Fire hose coupling.....E. Mayer  
Fire kindler.....L. S. Murdoch  
Firearm. Magazine.....J. D. Pederson  
Fireproof floor and ceiling construction.....J. T. Simpson et al  
Fish hook.....C. J. Trakel  
Fish net.....G. L. Plumley  
Fish trap. Floating.....A. C. Burdick  
Fishing rod. Folding.....H. M. McNamee  
Flue. Smoke.....D. Einstein  
Flushing apparatus. Closet.....F. Light  
Folding chair.....A. D. Truesdell  
Folding gate.....J. W. Sharrard  
Foliage and making same. Artificial.....C. E. Akeley  
Foot and body warmer. Portable.....F. Batter  
Friction brake.....R. R. Osgood  
Fruit picker's receptacle.....J. J. Jones  
Furnaces. Cinder or hot metal car for blast.....E. A. Weimer  
Galvanic battery.....H. Halsey  
Game apparatus.....W. C. Farnum  
Game apparatus.....D. Gailey  
Game apparatus.....F. W. Baynes  
Garbage can or receptacle.....E. L. Schiefer  
Garbage crematory.....C. A. Williams  
Garbage plant.....C. S. Wheelwright  
Garden tool.....J. E. Beebe  
Garment clasp.....E. H. Gysling

Garment fastenings. Card or mount for.....O. A. De Long  
Garment sections. Marking and folding.....P. J. Menahan  
Gas generating apparatus. Acetylene.....J. J. Hendler  
Gas generator. Acetylene.....A. Davis  
Gas generator. Acetylene.....R. J. Atkin et al  
Gate.....J. H. Moss  
Gear wheel.....R. E. Evenden  
Gearing. Variable speed.....J. H. Braithwaite  
Glass shaping machine.....W. M. Wolcott  
Glass tile. Manufacture of.....H. J. Sage  
Glazing conservatories, hothouses.....A. Tassain  
Gold separating apparatus for dredging machines.....J. H. Gray  
Grinding machine 2 pats.....G. M. & C. J. Luther  
Grinding or sharpening device.....I. M. Rose  
Grinding or smoothing machines. Apparatus for supplying abrasive material to.....D. J. Murnane  
Gun carriage.....O. Behnke et al  
Gun. Tubular magazine.....T. C. Johnson  
Guns. Automatic firing apparatus for ships.....H. von Pechy et al  
Guns. Two tube gravity charger for magazine.....T. C. Johnson  
Hair pin.....R. G. Schutz  
Hand rail for moving stair lifts.....J. M. Dodge  
Hand rail. Moving.....J. M. Dodge  
Harness attachment.....J. W. Beam  
Hat body drying apparatus.....E. Hill  
Hay press.....W. N. Newton  
Heat regulating apparatus.....H. Winkenwerder et al  
Heating furnace.....H. C. Ryding  
Hide fleshing machine.....O. F. Felix  
Hinge.....R. S. Bowen  
Hinge. Adjustable door.....A. Christerson  
Hinge. Box.....A. B. Miller  
Hitching attachment. Vehicle.....C. Boulard  
Hogshead cover.....G. A. Krieger  
Hoof boot or pad.....G. W. Nickerson  
Hook.....L. A. Walker  
Hook and eye.....G. W. Washburn  
Horse boot.....G. H. Weeks  
Horseshoe. Cushion thread.....A. J. Puhl  
Horseshoeing apparatus.....D. E. Kepford  
Hose or pipe mender.....R. F. Kunze  
Hose supporter.....M. Scheuer  
Humidifying the atmosphere. Apparatus for.....L. C. Bulkley  
Husking rollers.....T. Guest  
Hydrocarbon burner.....W. R. Jeavons  
Ice shaver.....2 pats.....J. F. Williams  
Incubator.....J. W. Sauer  
Indigo. Hydrosulfite for reducing.....M. Bazlen  
Ink.....H. H. Spohn  
Ink well.....C. E. Stanley  
Insufflator.....S. Hasbrouck  
Insulating high potential apparatus.....W. S. Moody  
Ironing table and clothes rack. Combined.....J. Carroll  
Jars, &c. Device for lifting fruit.....J. K. Rettig  
Journal box.....M. H. De Vore  
Journaling and sustaining device for rotating parts.....O. Ohlsson  
Knitting machine stop motion.....H. F. & C. C. Bockmeyer et al  
Knockdown chair. Double seat.....H. Morton  
Laboratory. Pocket.....F. Flavitsky  
Lace holder. Shoe.....C. E. Wettlaufer  
Ladder. Extension step.....L. Ferguson  
Ladder hook. Automatic extension.....L. Ferguson  
Lamp. Electric.....H. N. Potter  
Lamp globes, &c. Support for.....G. H. Crist  
Lantern.....R. Walsh  
Latch. Lock.....M. Vallee  
Leather. Manufacturing artificial.....L. G. Naert  
Leather staking machine.....H. Roeske  
Life preserver. Marine.....J. Ewing, Jr  
Lifting jack.....J. W. Garlaud et al  
Linotype machine.....G. A. Bates  
Linotype machine.....J. W. Champion  
Liquids from solids. Apparatus for separating or draining.....C. S. Wheelwright  
Loading machine. Sand.....C. Bosselman  
Loading or unloading device.....E. C. Starks  
Lock.....J. Schell  
Lock and latch. Combined.....E. Peterson  
Lock attachment. Cylinder.....W. B. Moore  
Loom. Needle.....E. Herzog  
Loom warp stop motion.....C. F. Roper  
Loom web feeler.....T. McAuliffe et al  
Loom web stop motion.....J. A. Clark  
Lubricating apparatus.....M. B. Hansen  
Lumber. Stacking.....F. M. Hazleton  
Magneto electric generator mechanism.....L. G. Wooley  
Mail box. Rural free delivery.....H. N. King  
Mail or letter drop.....E. G. Gordon  
Malt for mashing. Preparing.....V. Lapp  
Massage machine support.....F. King  
Match box.....G. R. Bilz  
Match box for mine lamps.....I. A. Sharp  
Match lighter.....J. E. Sharpe  
Measuring instrument.....B. F. Westcott  
Meat tenderer.....O. Pike, Sr  
Merry-go-round.....J. L. McCrea  
Metals. Pulverizing.....C. Berton  
Middlings purifier.....H. C. Robison  
Milk cooler.....R. H. Casswell  
Milking machine vacuum regulating device.....F. M. Devore  
Musical instruments. Action for stringed.....D. P. & L. F. Boyd  
Neckwear supporter and fastener.....O. Kraus  
Nozzle.....W. C. Oberwalder  
Nut attachment. Spindle.....E. Carlton  
Nut Lock.....G. W. Brown  
Nut lock.....W. Noble  
Oil burner.....J. J. McDonald et al  
Oil burner and feed mechanism therefor.....J. W. Anderson  
Oil burner. Petroleum.....A. F. Memory  
Oil cup.....R. L. White  
Oiler. Automatic cross head pin.....C. A. V. Carlsson et al  
Ore, rock, cement, &c. Machinery for crushing or grinding.....D. Honeywood

Ore screening, washing, and assorting apparatus.....F. Hermann  
Ore treatment. Machine for mixing and storing liquids and gases for.....S. C. C. Currie  
Oven. Bake.....C. P. Dowd et al  
Package. Storing and shipping.....J. M. Hommel  
Packages. Adjustable mouth for shipping.....C. O. C. Leigh  
Packing. Piston.....J. T. Wilson  
Papers. Apparatus for drying coated.....W. M. Barber  
Partition blocks. Mold for making.....A. C. Rader  
Pasting mechanism.....O. Tyberg et al  
Pavement.....F. E. Gregory  
Pavements. Repairing American asphalt.....reissue.....A. H. Perkins  
Peas, beans, &c. Shelling.....J. P. Scovill  
Peeling or otherwise preparing vegetables or fruits. Utensil for.....P. W. Nelson et al  
Peeling tomatoes, &c.....J. P. Scovill  
Peeling tomatoes, &c. Apparatus for.....J. P. Scovill  
Pen. Fountain.....H. W. Stone  
Petroleum burner. Crude.....R. B. Fageol  
Photographs, graphophone, &c. Support for.....E. A. Hawthorne  
Photochemical and electrotherapeutic apparatus.....A. E. Sterne  
Photographic printing frame.....W. H. Smith  
Piano action.....S. R. Perry  
Pianoforte wires. Device for cleaning.....J. Barnett et al  
Piano self-playing attachments. Pedal mechanism for.....J. Wieser  
Piano. Upright.....H. Ziegler  
Pie and pastry rack. Collapsible.....S. M. Davison  
Pigment and making same.....W. J. Armbruster  
Pipe heating and welding apparatus.....R. A. M. & A. W. Slater  
Pipe. Machine for inverting sewer.....H. A. Williams et al  
Pipe wrench.....S. Stucky  
Planter. Corn.....E. M. Sell  
Planter. Seed.....C. L. Ferriott  
Plate press attachment.....R. Turner et al  
Pliers.....Z. T. Furbish  
Plow wheel.....C. H. Melvin  
Plow. Wheel.....N. Sanders  
Plumber's implement.....G. J. Williams  
Pneumatic despatch tube apparatus.....B. C. Batcheller  
Poison distributor.....H. Clayton et al  
Pole tip. Wagon.....P. McBenett  
Portable bracket.....A. R. Ferguson  
Post hole digger.....H. Hogle  
Potato grading or assorting machine.....J. Thompson  
Potato masher.....F. B. Holder  
Power factor indicator.....W. H. Pratt  
Precious metals. Treating ores containing.....S. C. C. Currie  
Press.....J. C. Taft  
Pressure gage testing apparatus.....A. G. Wood  
Printing wheel. Adjustable.....J. H. Horan et al  
Propeller for the propulsion and steering of ships.....J. Sinclair  
Propulsion. Canal boat.....J. C. Tone  
Pruning implement.....H. A. Hill  
Pulp machine. Wood.....C. W. Roberts  
Pulverizing machine.....L. S. Pfoutz  
Pump. Air.....C. L. Wilkins  
Pump or motor. Rotary.....W. S. Austin  
Punch. Metal.....W. S. Mendenhall  
Puzzle.....G. B. M. Tweedy  
Rail bender.....C. A. Davis  
Rail fastening.....C. E. Neubauer  
Railway danger signal.....C. P. Bass  
Railway frog.....E. B. Douglass  
Railway frog and switch mechanism.....L. Green et al  
Railway rail.....J. S. Fox  
Railway switch.....H. Blanchard  
Railway tie. Metallic.....G. F. Stansbury  
Railway tie rail fastening.....F. Foster  
Railway track. Street.....J. Scanlan  
Railway water column.....A. K. Mansfield  
Ranges, stoves, or furnaces. Hot blast for.....J. B. Ehrlich  
Ratchet wrench. Revolving.....J. C. Carlhime  
Reamer.....J. W. Sweeting  
Reflector. Lamp.....J. R. Flagg  
Refrigerator machine.....J. C. Goosmann  
Registering apparatus.....H. Bean  
Rod cutting device.....C. L. Butler  
Rolling machine. Metal ball.....O. Spahr  
Rolling mill feed mechanism.....J. J. Purcell  
Rotary engine.....G. W. Wood  
Rotary engine. Multicylinder.....W. Scantlebury  
Rotary gas engine.....W. M. Everett  
Sawmill. Portable.....E. H. Hanssler  
Sawing machine.....W. H. Fullerton  
Scale relieving gear.....F. W. Taylor et al  
Scavenging machine.....J. Briggs  
Seal.....3 pats.....T. I. Porter  
Seal. Snap.....2 pats.....E. J. Brooks  
Seals. Machine for making bottle.....G. E. Painter  
Seat spider.....2 pats.....H. W. Bolens  
Seed from the hulls. Apparatus for separating the meat of cotton.....L. W. Merriam  
Seeder. Broadcast.....C. P. Sester et al  
Seeding device.....J. Tchooljian  
Seeding machine covering device.....A. C. Lindgren  
Separator.....J. W. Burton  
Sewage trap.....D. J. Lynch  
Sewing machine. Overseaming.....S. Arnold  
Sewing machine stitch forming mechanism. Shoe.....J. L. Kieffer  
Shaft coupling. Angle.....S. W. Robison et al  
Shaking screen.....G. S. Iugle  
Sharpening device. Knife.....G. L. Plumley  
Shoe.....H. F. Buttner  
Shoe protector.....B. F. Bond  
Show windows, show cases, &c. Corner construction for.....G. M. Chambers  
Shutter. Awning.....D. W. Custer  
Shuttle.....J. H. Morin  
Singletree attachment.....J. A. Cake  
Skewer machine.....O. P. Beck



Skirt supporter.....J. H. Griswold  
Sleeve protector holder.....G. W. Davis  
Soap granulator.....C. A. Samuelson et al  
Soldering machine bucket, Can.....W. R. Gorrell  
Spike puller.....T. G. Brown  
Spiral elevator.....D. E. Condon  
Spoke finishing machine.....G. A. Ensign  
Spraying device.....S. Hasbrouck  
Stacker, Straw.....F. Torbeck  
Stalk cutter.....J. W. Nutsch  
Starching or dampening machine.....A. P. Vreeland et al  
Steam boiler.....R. W. Barton  
Steam boiler.....H. A. House, Jr  
Steam engine.....J. W. McQuay  
Steam engine.....W. Sutcliffe  
Steam from hot slag. Apparatus for generating.....H. A. Seymour  
Steam generator.....H. E. Penney  
Steam generator.....E. E. Taylor  
Steam generators, &c. Apparatus for purifying water for.....E. Delmouly  
Steam or hot water trap.....M. Conley  
Steam superheater.....H. Webster  
Steam trap.....J. J. Burke  
Steering apparatus.....D. W. Rantine  
Stitch separating machine.....J. B. Hadaway  
Stone blocks. Apparatus for making hollow artificial.....S. Giletti  
Stop motion for preparing, spinning, and doubling machines.....W. Hilton  
Storage and reloading apparatus.....A. W. J. Selleck  
Storage battery.....B. Ford  
Stove. Heating.....C. Matthews  
Stove or range. Cooking.....G. E. Wilbur  
Stovepipe elbow connection.....A. Neilson  
Stovepipe hole cover.....W. A. Kuhlman et al  
Strainer.....G. L. Wackerow  
Street sweeping device.....I. A. McCormack  
Sulfite works. Acid chamber.....W. A. McKee  
Suspenders.....F. W. Potter  
Swimming. Foot gear for.....P. J. Griffin  
Switch operating mechanism. Electrical.....Reissue  
Switch stand.....C. B. Russel  
Table knife.....G. L. Mansfield  
Tanning wheel.....B. Jr. & W. C. Allen  
Telegraph and telephone system. Combined.....C. H. Gaunt  
Telegraph instrument.....E. Bing et al  
Telegraph pole.....W. J. McCarthy  
Telephone exchanges. Service meter system and apparatus for.....A. M. Bullard et al  
Telephone transmitter.....J. A. Wotton  
Thermionic apparatus.....C. G. Burke  
Thermometer. Clinical.....C. J. Fritsch  
Thresher. Grain.....W. Maloney  
Threshing machine. Grain.....W. Maloney  
Tile. Roofing.....J. Schall  
Tire.....C. H. Wilkinson  
Tires. Making self mending.....J. W. Blodgett  
Tobacco pipe.....F. H. A. Moehlenbrock  
Tobacco pipe.....E. B. Watson  
Tool handle.....F. E. Davis  
Tooth. Artificial.....W. F. Wheeler  
Toy.....J. W. Macdonald  
Toy. Automatic.....R. H. & R. D. Adams  
Trace holder.....W. F. Simon  
Traction apparatus.....N. Hiss  
Tram seat.....H. S. Haigh et al  
Transit.....G. L. Buft  
Trolley system. Electric railway.....J. S. Fox  
Trolley. Traversing crane.....O. Briede et al  
Trousers attachment.....J. F. Williams et al  
Turpentine. Apparatus for collecting crude.....C. H. Herty  
Twist or like drill.....J. W. & H. Platt  
Twitch.....D. J. Friesen  
Type writer cabinet.....G. J. Barrett  
Vacuum. System for production of.....F. Panta  
Valve.....J. S. Stevens  
Valve.....H. M. Ware  
Valve.....F. E. Collins  
Valve. Electrohydraulic.....C. Engberg et al  
Valve. Reciprocating engine.....J. H. Allen  
Vapor burner.....W. Wahlberg  
Vase.....D. Moriarty  
Vault. Portable grave.....L. Vosburg  
Vegetable cutter or slicer.....J. Y. Kline  
Vehicle controlling means. Motor.....D. E. Johnson  
Vehicle. Motor.....S. S. & A. Lewis  
Vehicle wheel.....J. S. Layton  
Vehicle wheel.....W. R. Wood  
Vehicle wheel brake.....W. Fraser  
Velocipede.....E. R. Estep  
Ventilating cap for cellar doors, skylights, &c.....H. E. Tompson  
Vessel loading or unloading apparatus.....W. J. Selleck  
Vessel ventilating port.....J. W. Atlee  
Violin bridge.....W. H. McWhirter  
Voltaic cell.....M. E. Conrad  
Wagon. Dumping.....J. Thompson  
Wagon. Dumping.....A. Tufani  
Wagon. Dumping.....A. Carey  
Wagon gear.....S. W. Taber  
Waistband.....M. Oppenheim  
Wall or chimney construction.....J. F. Lyman  
Walls and partitions. Construction of.....J. F. Golding  
Water closet attachment.....R. L. White  
Water gate.....J. McCormick  
Water gage.....L. Parker  
Water heating and purifying device.....D. Cochran  
Waterproof covers or tarpaulins. Dressing for.....M. G. Peters et al  
Water purifier.....E. Kaiser  
Weather strip.....J. D. Grover et al  
Weather strip. Door.....H. M. Lucia  
Weather strip. Metal.....H. E. Kenny  
Weigher. Grain.....C. Sherman  
Weighing cotton, &c., in bulk. Apparatus for.....F. L. Dyer  
Welding machine clamp device. Electric.....A. F. Rietzel  
Well casing sections. Machine for screwing or unscrewing.....W. H. Downing  
Well pipe puller.....J. A. De Vore  
Wheelbarrow. Dumping.....E. F. Braucher  
Wheel support. Rubber tired.....F. Schulze  
Whiffletree clip.....T. J. Bullock  
Windmill regulator.....K. K. Lerol, Jr  
Window lock.....H. Hubbs  
Wort. Accelerating the production of.....V. Lapp  
Wrench.....R. H. Hearn  
Wrench.....J. T. Neely  
X-ray apparatus for treating diseases.....H. E. Waite

## DESIGNS.

Coffin trimming.....W. E. Stevens  
Fabric.....F. A. Arbenz  
Medal or similar article.....S. R. Earnest  
Reflector for artificial lights.....2 pats.  
Sign box.....J. N. Early  
Statuette.....2 pats.  
Stove. Oil.....W. H. Wilder

Issued February 10, 1903.

## MECHANICAL PATENTS.

Abdominal supporter.....D. Gleason  
Addressing and assorting machine.....L. A. Agnew  
Air moistening apparatus.....A. Levy  
Amusement apparatus.....T. Folks  
Armature band.....J. J. Wood  
Armature banding device.....J. J. Wood  
Armature. Drum.....H. A. Balcome  
Auger. Earth.....A. L. Kitzelman  
Auger. Spoke.....J. M. Brown  
Bag holder and filler.....H. T. Wiley  
Bale tie.....S. T. Green  
Baling press.....M. D. Hunt  
Balls. Making shells for playing.....F. H. Richards  
Bank and register. Cyclic.....O. R. Myers  
Barrel head.....G. F. McKeever  
Barrel washer.....S. C. O. Berg  
Basin. Catch.....L. Skaife  
Bath tub shower-bath attachment.....J. Carmichael  
Battery plates. Preparing storage.....R. N. Chamberlain  
Bearing balls. Machine for reducing and finishing hollow.....A. Joanson  
Bed. Folding swing.....S. Drubech  
Bell. Magneto.....C. H. Thordarson  
Blind and fixings for same. Roller.....A. E. Millane  
Bogevener.....A. Kepler  
Boiler cleaner. Steam.....R. B. Dodge  
Boiler compound.....J. Loudeuslager  
Boiler furnace and flue. Steam.....E. Gearing  
Bolster.....H. T. Krakau  
Bookcase. Revolving.....D. A. B. Stoddard  
Bottle capping machine.....M. E. Noyes  
Bottle closure.....E. M. Gilmore  
Bottle. Non-refillable.....R. Koch  
Bottle. Non-refillable.....H. A. Daniels  
Bottle. Non-refillable.....S. W. Plummer et al  
Brake shoe. Railway.....J. Meehan  
Brick machine.....S. C. Brush  
Broom.....R. Rosenbaum  
Brush.....J. Moss et al  
Buckle. Cotton bale tie.....J. F. Matthews  
Buckle shoe.....D. E. White  
Buggy seat support brace.....J. S. Jones  
Burner.....H. Oberlin  
Button. Badge.....A. Phelps  
Cable grip.....S. S. McCain  
Cableway. Elevated.....W. Kirry  
Calculating machine.....J. A. Turck  
Camera.....H. W. Locke  
Camera. Photographic.....L. Borsum  
Can filling device.....W. H. Sedberry  
Can lid or the like. Milk.....W. Gorman  
Car and air brake coupling. Combined street car bolster.....L. C. Cary  
Car bolster.....G. H. Goodell  
Car bolster. Hopper.....A. Christianson  
Car bolster. Hopper.....J. M. Hansen  
Car brake.....H. Jones  
Car brake.....R. E. Kimball  
Car brake. Emergency.....A. Perry  
Car coupling.....B. Brand  
Car despatcher's time apparatus.....S. A. Riggs et al  
Car door.....W. A. Scott et al  
Car door. Box.....E. F. Luce  
Car draft block attachment. Freight.....T. M. Baughan  
Car. Dump.....F. S. Ingoldsby  
Car fender.....J. P. Thom  
Car gas reservoir. Railway.....C. Goldstuecker  
Car. Railway.....G. E. Smith  
Car safety brake apparatus. Motor.....C. F. Peel, Jr  
Car safety chain fastening.....A. Christianson  
Car step. Adjustable.....A. J. Coover  
Car switch. Automatic street.....L. Devers  
Car with flush door. Flat bottom.....J. M. Hansen  
Cars. Adjustable stirrup step for.....A. J. Coover  
Carburetor.....C. Robinson  
Card holder for envelopes or wallets.....A. Bushnell, Jr  
Carpet fastener. Stair.....C. W. Leslie  
Carriage body.....R. Stone  
Cash register.....B. K. Hoppock  
Cash register.....C. Lauck  
Casting crucible steel ingots.....J. F. McGrath  
Casting packing rings. Mold mechanism for.....S. B. Mack  
Catching and delivering apparatus.....T. H. Patenall  
Centrifugal separator.....P. L. Kimball  
Chalk holder.....J. B. Gurry  
Chatelaine bag, &c.....O. Greenbaum et al  
Chime ringing device.....H. A. Wende  
Chimney top.....F. Wunderlich  
Churn.....T. J. Cheney  
Churn dasher.....M. V. Wisker  
Cigar box.....H. H. Ziemer  
Cigar maker's work box.....E. J. Castillo  
Cigar or cigarette holder.....W. E. Davidson  
Clamp.....H. F. A. Kleinschmidt  
Clarifier cover. Centrifugal.....W. W. Price  
Cloth cutting machine.....W. Corman  
Cloth folding mechanism.....F. D. Taylor  
Clutch. Friction.....M. Campbell  
Coal. Briquetting.....A. Waddell  
Coated articles. Apparatus for removing surplus metal from.....G. Porter  
Cock. Gas.....W. E. Hawkins  
Coin bunching machine.....J. Rice  
Coin slot device.....F. B. Hoffman  
Coke, &c. Apparatus for cooling.....I. W. Pike  
Commutator meter.....J. F. Kelly  
Compound expansion fluid engine.....F. G. & R. Goodfellow  
Concrete block mold.....E. W. Seaman  
Continuous press.....J. Ingleby  
Core anchor. Sand.....J. G. Emrich  
Corn eradicator.....J. B. Abler

Corn shock frame.....H. H. Schenk  
Corner post pocket.....A. Christianson  
Corset.....L. Lawrence  
Crane. High speed train staff.....T. H. Patenall  
Crate. Folding.....G. J. Cline  
Crushing mill.....H. U. Prindle  
Culinary device.....A. M. Stocking  
Cultivator.....E. Haiman et al  
Cultivator.....T. Hanson  
Cultivator. Lister.....A. C. Lindgren  
Cultivator. Middle.....M. A. Piper  
Cultivator. Tree.....J. M. Collins  
Current regulator.....J. J. Wood  
Currycomb.....C. Lind  
Curtain pole.....W. A. Hunt et al  
Curtain pole hanger.....R. A. E. Reigard  
Curtain pole. Window.....T. Hoffman  
Cutter guard.....A. Lemmon  
Cyanogen compounds. Producing.....J. Bueb  
Cycle propelling gear.....D. E. Norton  
Davit for ships. Boat.....N. Murchison  
Deaf and blind mutes. Communicating language for.....J. Reese  
Decoration. Festoon.....W. C. Lucas  
Dental charcoal point.....L. Arndt  
Dental impression cup.....G. A. Brouillet  
Die socket.....G. A. Kener  
Display cabinet.....J. H. Tracey  
Display cabinet. Hat.....A. R. Du Boise  
Display case.....J. J. Donnelly  
Display clamp.....A. L. Young  
Display counter.....I. N. Landauer  
Display package.....P. R. Hazeltine  
Distribution system.....2 pats. A. S. Hubbard  
Doffer. Fiber machine.....D. M. Sullivan  
Door closer and check.....A. J. Rosentretter  
Door operating appliance.....F. L. Brewer  
Door or window. Screen.....L. H. Hixson  
Draft equalizer.....D. Lawrence et al  
Draft gear. Hydraulic.....P. H. Peterson  
Draft hook. Emergency.....2 pats. C. Wahl  
Dratt rigging.....3 pats. H. T. Krakau  
Drill apparatus for drilling rock, mining, &c.....W. A. Box et al  
Drill blank twisting machine.....R. L. Barclay  
Drill straightening machine. Twist.....R. L. Barclay  
Driving band.....G. Fouillaron  
Dust arresting bag.....J. S. Thurman  
Dust catcher and blast heater. Combined.....W. E. Koch et al  
Dyeings. Increasing the fastness of indigo.....A. J. Stieglmann  
Educational art text sheet.....W. Seegmiller  
Educational device.....W. C. Williams  
Egg or fruit case.....W. Wilson  
Elastic bands to articles of manufacture. Machine for applying.....M. Setter  
Electric cable.....R. F. Hall  
Electric controller.....R. W. Brown  
Electric furnace.....J. F. Hammond et al  
Electric motor controller.....O. Holz  
Electric switch.....R. N. Chamberlain  
Electrical apparatus. Apparatus for making coils for.....E. L. Aiken  
Electrical apparatus coil.....E. L. Aiken  
Electrical distribution. Self-regulating system of.....A. S. Hubbard  
Electrical knife switch clip.....C. D. Platt  
Electromedical apparatus.....G. S. Rider  
Elevator.....A. B. Roney  
Elevator brake attachment.....G. W. Chamberlain  
Elevator safety attachment.....W. O. Day  
End post pocket.....A. Christianson  
Engine speed regulator. Explosive.....L. A. Frayer  
Engine vaporizer. Gasolene.....G. A. Ede  
Engines. Means for controlling fluid-pressure.....H. Swanton  
Envelop opener.....P. G. Munchinger  
Envelop. Safety.....G. W. Fletcher  
Envelops, papers, &c. Holder for.....A. Brunson  
Evaporating apparatus.....O. M. Nilson  
Evaporating pan.....J. E. Burnett  
Fastener.....L. W. Luellen  
Feed roll.....G. A. Ensign  
Feed water heater.....I. Watts  
Fence. Portable.....J. C. Simmons  
Fertilizer distributor and corn planter. Combined.....L. C. Gillespie  
Figure or show stand. Adjustable.....C. Dargie  
Film washing and drying device.....E. W. Newcomb  
Fire and police alarm call system.....W. J. Hofstatter  
Fire escape and ladder.....H. Bracklo  
Fire escapes. Life saving apparatus for use in connection with.....J. Haswell  
Fire extinguisher. Automatic stationary.....W. Esty  
Fire extinguisher truck.....R. M. Green  
Fish hook.....M. J. Amsden  
Fish hook.....W. G. Little  
Fish hook releaser.....J. Hallirau  
Fish skinning and scaling device.....W. Kadletz et al  
Fishing reel side plate.....J. E. Pfeuger  
Flower holder.....F. W. Green  
Flue stopper.....J. L. Clark  
Fluids. Apparatus for electro-endosmotically freeing materials from.....B. Schwerin  
Fly escape attachment for window screens.....W. H. Spake  
Fly killer stay.....B. F. Douglass  
Folding bench.....W. A. K. Martin  
Food products. Preparing cereal J. B. Espey  
Fruit pitter.....O. L. Scott  
Furnace.....G. W. Lyon  
Furnace apparatus.....F. H. Foote et al  
Furniture. Convertible.....G. Brown  
Fuse box. Electric.....T. Van Aller  
Fuse head and fuse. Electrical.....F. Schmitt et al  
Game apparatus.....G. E. Mellen  
Garment hanger.....A. F. Barnum  
Gas burner.....U. S. McCormick  
Gas burner cap. Incandescent.....J. N. Webb  
Gas generator. Acetylene.....J. K. Rush  
Gas light fixture. Incandescent.....J. Hutchinson  
Gas mixer. Convertible.....W. E. Guese  
Gearing for centrifugal machines.....G. M. Anderson  
Gin saw sharpener.....J. S. Garner  
Glass. Curvilinear corrugated prismatic.....C. C. Hartung  
Glass. Curvilinear prismatic.....C. C. Hartung  
Glass making apparatus. Sheet.....R. L. Frink et al  
Globe holder.....B. M. Windoes

Golf game. Indoor.....H. H. Taylor  
Governor. Engine.....O. Hove  
Gravity. Apparatus for demonstrating the laws of.....J. S. Hemenway  
Grinding and polishing machine.....G. W. Wells  
Guide wheel and guide.....A. H. Mathesius  
Guns, &c. Apparatus for tempering parts of.....A. H. Emery  
Gyrating machine.....G. W. Combs  
Hairfastener.....J. Erikson  
Hammer handle safety fastening.....F. Straub  
Hammers. Machine for manipulating automatic.....C. R. McKibben  
Harvester.....J. F. Appleby  
Harvester. Corn.....W. E. Koch  
Harvester. Grain.....J. F. Appleby  
Hat pin.....J. A. Hamelback  
Hatchway gate.....J. Bayer et al  
Hay press.....J. W. McNair  
Hay tedder.....S. B. Bamford  
Heat bath. Radiant.....M. Joachimson  
Heat distributor.....A. Herig  
Heating can for fruit or vegetables, &c.....G. S. Jewett  
Heel for footwear. Safety.....H. C. Karpenstein  
Heel seating machine. Spring.....B. E. Morrison  
Hinge. Separable.....R. G. Winter  
Hinge. Spring.....W. J. Cowan  
Hinge. Spring.....W. J. Keene  
Hoisting or lowering material. Apparatus for.....J. F. Cook  
Horseshoe.....C. Glaum  
Horseshoe.....W. M. Dickey  
Horseshoe calk. Detachable.....A. Corcoran  
Hose clamp.....F. Straub  
Hose reel attachment automatic.....J. H. Couch  
Hose supporter.....2 pats. T. P. Taylor  
Hose supporter clamp.....M. B. Hammond  
Hotbed.....W. S. Bodley  
Hub. Wheel.....S. Schoth  
Hydraulic apparatus. Automatic.....A. B. Lawther  
Hydraulic machinery. Apparatus for automatically regulating the supply of water under pressure to.....L. Lacoiz  
Hydraulic power machine.....G. W. Siem  
Illuminating prism structure.....F. L. O. Wadsworth  
Insulator.....H. R. Sargent  
Ironing table.....L. O. Kelly  
Knife.....F. White  
Knitting machine.....H. Clarke  
Knitting machine.....A. B. Dodge et al  
Knob attachment.....B. W. Norton  
Knockdown house. Canvas covered.....J. H. Hagedorn  
Labeling machine.....F. C. H. Strasburger  
Lamp. Electric arc.....H. Baggett  
Lamps, &c. Globe holder for arc.....J. J. Wood  
Lantern. Signal.....H. L. Moore et al  
Lantern slide shifter. Magic.....T. S. Barbour  
Lap robe or storm apron. Roll.....A. O. Kutscher et al  
Latch. Door.....C. P. & F. E. Howard  
Ledger. Bank.....E. Ford  
Level.....R. W. Hodgins  
Light rays. Coloring screen for white.....C. F. Schroeder et al  
Lightning arrester.....J. P. Coleman  
Linotype machine. Means for setting tabular matter in.....T. Martin  
Lithographic or other purposes. Manufacturing artificial stones for.....F. Heuber  
Lock and latch.....R. W. H. Rodney et al  
Lock and latch. Combined.....E. More  
Locket.....W. H. Blaney  
Logs. Means for raising sunken.....B. H. Harris  
Loom. Automatic filling replenishing.....E. S. Wood  
Loom. Multiple shuttle.....L. E. Salisbury  
Loom pick ball holder or guard.....J. Blanchette  
Loom stopping mechanism.....J. V. & E. Cunniff  
Looms. Knife sled motion for pile fabric.....E. H. Ryon  
Looms. Tip support for automatically filling replenishing.....E. S. Stimpson  
Looms. Weft feeder for replenishing.....T. McAuliffe  
Lowering persons or dead weights. Apparatus for.....A. Wyss-Baumgartner  
Lubricating device for car axle journals.....F. B. Harrison et al  
Lubricating press.....W. Michalk  
Magnetic separator.....J. Kirschweg  
Mail bag holder.....D. S. Baldwin  
Mail box. Rural delivery.....M. S. Norton  
Mandrel for conduit sections.....R. W. Lyle  
Mast. Automatically lowering.....C. Schwanebeck  
Match safe.....W. A. Patten  
Matches. Device for the ignition of slow.....J. von der Bosch  
Mattress filling.....S. J. Stevenson  
Measuring electric currents. Means for.....G. N. Eastman  
Measuring vest.....R. W. Grendon  
Mechanical movement.....J. E. Hausfeld  
Medicinal battery.....F. Grimshaw  
Metal atomizing apparatus.....W. H. Rowley  
Metals, &c. Compressing.....W. Holzer  
Metals from their ores. Recovering and separating.....H. A. Frasch  
Milk jar protector.....R. E. Gatter  
Mine cage.....D. F. Lepley  
Mine ventilator.....D. F. Lepley  
Molding apparatus.....E. Cross  
Molding machine.....R. Campbell  
Monolithic construction.....W. C. Lyon et al  
Moth bag. Self sealing.....S. L. McMillan  
Motive power engine.....H. Paysan  
Mowing machine.....J. W. Latimer  
Napping machine.....H. S. Greene  
Newspapers, &c. Machine for folding, wrapping, addressing, and assorting.....L. A. Agnew  
Nut lock.....B. Tucker  
Oil burner.....C. W. Sievert  
Oil can.....R. P. Hardy  
Oil from seeds. Apparatus for automatically extracting.....A. B. Lawther  
Ore separator.....R. B. Emmons et al  
Ores. Reducing.....M. Ruthenberg  
Pails, &c. Attachment for.....F. P. Mahon  
Paper bags. Manufacturing square bottom.....W. A. Lorenz  
Paper. Device for holding loose or removable sheets of.....R. G. Whitlock  
Paper feeding apparatus.....E. J. Hallberg  
Paper feeding machine.....L. F. Fuchs et al  
Paper. Manufacture of.....W. T. Armistead  
Penholder. Pen ejecting.....B. B. Goldsmith  
Perforating machine.....J. W. Hedgepeth  
Phonograph vibratory membrane.....V. L. Garcia



Piano player tune sheets. Perforation spacing device for automatic..... A. S. Seville  
 Pick. Mining..... G. T. White  
 Pipe. Apparatus for making butt weld..... P. Patterson  
 Pipe. Apparatus for the manufacture of butt weld..... J. H. Matheson  
 Pipe connection..... L. G. Collins  
 Pipe coupling seal lock..... R. D. Tittle  
 Pipe covering. Steam..... S. W. Curtiss  
 Pipe joint. Sheet metal..... J. B. Wallace  
 Pipe. Manufacture of butt weld..... J. H. Matheson  
 Pipe wrench..... O. O. Storle  
 Pipes with sand. Mechanism for packing..... C. R. McKibben  
 Pitman connection..... J. L. Taylor  
 Placket closure..... L. W. & S. M. Luellen  
 Planter. Corn..... H. P. Adams  
 Planter. Corn..... T. Adams  
 Platinum contact substances. Regenerating..... C. Krauss et al  
 Plow..... C. R. Davis  
 Plow..... W. T. Ellis  
 Plow attachment..... E. Marsalis  
 Plow fender..... J. J. McManmon  
 Pneumatic despatch system terminal..... H. Ash et al  
 Pocket case..... R. Oertel  
 Pole or post anchor..... I. E. Clum  
 Pool table return ball attachment..... P. Lapp  
 Portable bath..... C. H. York  
 Post brace and anchor..... J. H. Harbold  
 Potato digger..... R. J. Thompson  
 Poultry or birds. Self locking leg band for..... C. C. Schild  
 Preserving device..... T. L. Martin  
 Preserving jar..... M. E. Perley  
 Preserving jar. Vacuum..... C. C. Giles et al  
 Printer's base and attachments..... T. Wensel  
 Printer's base clamp..... T. Wensel  
 Printing or other machines. Sheet separating and feeding mechanism for..... L. F. Fuchs et al  
 Printing paper bags and wrapping paper. Apparatus for..... M. Purdin et al  
 Printing press..... G. H. Pierce  
 Printing press..... C. R. Culley  
 Printing press sheet delivery mechanism..... W. S. Huson  
 Projectile. Armor piercing..... R. A. Hadfield  
 Projectile fuse..... G. E. Fiedler  
 Propelling mechanism. Boat..... D. E. Norton  
 Pulp digester lining..... S. A. Leavitt  
 Pulping machine..... F. I. du Pont  
 Pump..... H. M. Chase  
 Pump lubricator..... G. B. Essex  
 Pump. Oil..... C. W. Enos  
 Pump. Oil..... C. Hirsch  
 Pump operating device..... C. E. Burkholder  
 Punch..... O. D. Woodbury  
 Rail joint..... J. Kelly  
 Rail joint..... C. A. Snider  
 Railway. Electric..... 2 pats. F. M. Ashley  
 Railway. Electric..... T. E. Murray et al  
 Railway fusee projector..... W. C. Beckwith  
 Railway rail stay..... E. Laas et al  
 Railway switch..... W. Quintal  
 Railway switch..... A. Youngblood  
 Railways. Mechanism for removing ice and snow from the conducting or third rail of electric..... F. V. Winters  
 Range finder attachment..... R. J. Sheehy  
 Ratchet wrench..... J. W. Muskett  
 Razor. Safety..... G. W. Korn  
 Rein support..... J. S. Jones  
 Renovator. Pneumatic..... J. S. Thurman  
 Ribbon holder..... G. P. Schmidt  
 Ribbon winder..... W. A. Hayes  
 Rolling mill feed mechanism..... S. V. Huber  
 Roofing. Metallic..... G. Huth  
 Rotary engine..... R. B. Chritton  
 Rotary engine..... D. J. Bliss  
 Rotary engine..... J. W. & R. M. Anderson  
 Rotary engine..... J. L. McMillan  
 Rotary engine..... J. C. Wharton  
 Rubber. Machine for coating fabric with..... J. H. Pearce  
 Running gear..... C. W. Petro  
 Sad iron..... E. J. Hansen  
 Saddle for harness. Auxiliary..... H. Rittel  
 Safe protecting means..... G. W. Craig  
 Safety pin..... R. P. Brown  
 Salt grainer..... H. L. Hildreth  
 Salting machine. Automatic..... J. W. Gheen  
 Sash fastener..... G. Simpson  
 Sash lock. Automatic..... A. W. Adams  
 Sash. Reversible window..... P. E. Loree  
 Sausage stuffer and lard or jelly press. Combined..... M. J. Vogler  
 Saw..... R. H. Benner  
 Saw set..... G. Mossholder  
 Scenographic apparatus..... E. J. Austen  
 Scraper, chopper, and cultivator. Combined. cotton..... L. D. Moore  
 Scraper. Soil..... G. N. Perry  
 Screw cap..... A. R. Pritchard  
 Secondary battery..... F. Buchanan  
 Self heating can for canned goods..... S. Jewett  
 Shearing machine..... C. M. Palmer  
 Ship's log apparatus. Electrical..... T. F. & T. S. Walker  
 Shirt bosom..... C. L. & L. B. Kretschmar  
 Shoal water indicator..... F. E. Forster  
 Shock loader..... J. B. Schuman  
 Shoe paste applicator..... W. R. Smith  
 Shovel attachment..... W. T. Spillane  
 Show case..... C. F. Kade  
 Show case..... R. Mancha  
 Shutter fastener..... E. F. McIntire  
 Signaling apparatus and system..... E. E. Cement  
 Silo..... E. W. Gilbert  
 Skirt fastener..... D. J. Hauptman  
 Skirt waistband..... M. A. Ormsbee  
 Slack adjuster..... F. K. Howard  
 Smoke consuming apparatus. Furnace..... W. C. Courts  
 Snap hook..... A. L. Hines  
 Snap hook. Double safety..... J. S. Mugg  
 Snap hook. Swivel..... S. Phillips  
 Soap manufacturing apparatus..... J. Schwechler  
 Soles and heels of boots or shoes. Wheel for smoothing the edges of..... P. Duplessis  
 Solidifying and excavating the soil and constructing tunnels..... C. Soosmith  
 Speaking tube mouthpiece..... W. Cartwright  
 Speech receiver or transmitter guard..... S. J. Ballard  
 Spinning frame. Ring..... C. E. Lovejoy  
 Spring for furniture, &c..... W. Bursch  
 Sprocket wheel..... C. C. Keyser  
 Square head..... H. A. Rounds

Stack knife..... J. O. Byro  
 Stacker. Pneumatic straw..... W. C. Robby et al  
 Stamp mill..... W. S. McKinney  
 Starching machine..... L. Hoffmann  
 Stave cutting machine..... F. T. Brown  
 Steam. Apparatus for measuring the flow of..... J. Seidenor  
 Steam boiler..... G. A. Kennedy  
 Steam boiler. Sectional..... P. Wiedenfeld  
 Steam engine..... D. F. Lepley  
 Steam or other pressure chambers. Means for closing..... P. Kirgeis  
 Steam trap..... E. A. Adams  
 Steam trap..... R. H. Thorpe  
 Sterilizer..... R. Kny  
 Sterilizer door..... J. Brucker  
 Sterilizer case for pocket thermometers..... O. H. Elbrecht  
 Stove. Blue flame oil..... G. W. Ferdon  
 Stove gas burner..... C. F. Wilson  
 Stove. Lamp..... C. R. Sandvig  
 Stove plate..... L. W. Brown  
 Strainer..... W. Lewinski  
 Street sweeper..... D. Pike  
 Stopper. Automatic..... A. C. Gaynor  
 Suspenders..... 2 pats. H. C. Hine  
 Swing attachment..... G. S. Kerr  
 Switch device..... L. Horinko  
 Syringe. Hot air..... J. I. Richards  
 Syringe. Hypodermic..... J. N. Ranger  
 Tannin extracts. Making decolorized..... G. Klenk  
 Teaching the golf swing. Device for..... S. Clifford  
 Telegraph receiving tape. Chemical..... P. B. Delany  
 Telegraphy..... P. B. Delany  
 Telephone producing device..... G. R. Bonham  
 Telephone system..... E. E. Clement  
 Telephone transmitter..... F. S. Tucker  
 Tellurian..... E. P. Gram  
 Tent. Portable pleasure..... C. U. Krieg, Sr  
 Thill coupling..... E. Atterby  
 Thill coupling..... A. Paul  
 Threshing machine conveyor..... J. R. Harrison  
 Tire tightener..... A. McMaster et al  
 Tobacco cartridge..... E. G. Dexter  
 Tobacco press..... H. Nestest  
 Tool. Combination..... T. D. Milea  
 Torpedo for submarine mines..... F. Bauduin  
 Toy gun..... J. B. Popenhagen  
 Track brake..... H. D. Deshler  
 Train staff systems. Ring and pouch for high speed..... T. H. Patenall  
 Trammel..... C. M. Van Horn  
 Transplanting machine. Vegetable..... J. H. Carroll  
 Traveling table. Continuous..... J. Ingleby  
 Trolley and brake for aerial railways..... M. J. Doner  
 Truck bolster..... G. H. Goodell  
 Turbine. Compound steam..... H. F. Fullagar  
 Twine cutter..... E. F. Knowles et al  
 Type..... M. F. Benton  
 Type writer carriage..... L. S. Burridge  
 Type writer platen..... C. E. Peterson  
 Type writing machine..... G. B. Webb  
 Type writing machine..... F. W. Hillard  
 Umbrella rib and stretcher joint..... A. S. Venen  
 Undercut gate..... F. V. Hetzel  
 Valve..... W. J. Poole  
 Valve. Antifreezing compression..... P. Haas  
 Valve arrangement for locomotive or other engines. Relief..... A. Spencer  
 Valve. Check..... W. B. Bashlin  
 Valve. Pressure controlling..... A. S. Comstock  
 Valve. Pressure relief..... J. Nageldinger  
 Valve. Straightway..... E. M. Erdman  
 Vault. Portable burial..... B. F. Lockwood  
 Vehicle controlling gear. Motor..... J. Q. Chase  
 Vehicle. Motor..... C. L. Haase, Jr  
 Vehicle wheel..... R. E. Jeffery  
 Vehicles. Adjustable seat for two-wheeled..... A. Johnston  
 Vermin destroyer..... J. M. Phillips  
 Vessel. Metallic shipping..... C. M. Nelson et al  
 View outfit..... R. R. Whiting  
 Wagon. Dumping..... E. M. Sandy  
 Washboard attachment..... D. E. Van Gilder  
 Watch. Stem winding and setting..... 2 pats. C. Kuenzel  
 Water closet..... P. Haas  
 Water gate..... W. D. Wilson  
 Water heater..... D. E. Smoak  
 Water tank mold..... P. Mansan  
 Water tube boiler..... W. M. Jackson  
 Weigher. Automatic..... J. R. Harrison  
 Weighing machine..... J. Marshall  
 Weighing or packaging machine..... W. H. Doble  
 Welding compounds. Manufacturing..... P. Vervae  
 Well fishing implement. Oil..... W. Smith et al  
 Wheel..... C. Miller  
 Winding drum. Collapsible..... A. C. Mills  
 Windlass and winch. Combined..... H. D. Van Doorn  
 Windmill..... J. Henderson  
 Windmill regulator..... M. E. Lawrence  
 Window fastener..... J. M. McVoy et al  
 Window screen..... D. G. Elges  
 Windows, &c. Protector for..... J. N. Ferguson  
 Wire working machine..... A. C. Mills  
 Wood splitting device..... G. Eiden  
 Wrench..... N. Larsen  
 Wrist plate lock..... H. Weber  
 X-ray tubes. Automatic regulator for..... W. S. Andrews

## DESIGNS.

Bottle..... 2 pats. F. Schilling  
 Brushes, &c. Back for..... O. Leigh  
 Brushes, &c. Back for..... P. O. Dickinson et al  
 Button hooks, &c. Handle for..... O. Leigh  
 Chair. Rocking..... E. L. Brown  
 Spoons, &c. Handle for..... E. Crees et al  
 Vehicle body..... A. L. Riker

## Issue February 17, 1903.

## MECHANICAL PATENTS.

Adjustable seat..... A. Adler  
 Adjustable wrench..... G. M. Kifer et al  
 Advertising device..... E. J. Sedlack  
 Aerated liquids from bulk on draft. Apparatus for supplying..... W. Nicholles  
 Aerating apparatus. Liquid..... J. Gwynne et al  
 Aerial device..... 2 pats. C. A. Needham  
 Air in the production of mechanical energy. Utilization of liquefied..... C. S. Bradley  
 Alcohol burner..... J. P. Steppe

Alkylated auramins and making same..... C. Hoffmann  
 Amalgamator..... O. H. Burden et al  
 Amusement apparatus..... F. Robinson  
 Animal scraping or dehairing machine..... J. W. Kohlhepp  
 Animal trap..... W. Gabrielson  
 Atomizer..... J. Waldman  
 Attaching or detaching hook. Automatic..... W. E. Lafferty  
 Automobile driving gear..... E. Rawson  
 Awning..... G. E. Bedell  
 Axle box. Car..... G. G. Floyd  
 Badge..... G. H. Brooks  
 Badge and pin therefor. Button..... W. D. Beethnow  
 Bag holder..... A. D. Skinner  
 Bale tie..... C. W. Harmon  
 Bale tie..... S. J. Webb  
 Barium hydrate. Preparing..... C. E. Jacobs  
 Barrel holder..... M. Derrig  
 Battery system. Storage..... R. N. Chamberlain  
 Bedstead post and rail joint coupling..... A. W. Busby  
 Beer pipes, &c. Apparatus for cleaning..... E. Neely  
 Belt and garment supporter..... C. W. Kohlmann  
 Belt. Electromedical..... F. Farmer  
 Belt fastener..... M. A. Chilcote  
 Belt shipping device..... A. Coulter  
 Beverages. Apparatus for producing aerated..... P. E. Malmstrom  
 Bicycle seat post..... S. Bobo  
 Bicycle speed gear. Rear driven..... F. C. Haste et al  
 Bicycles. Apparatus for facilitating learning to ride..... F. von Trutzchler  
 Billet heating furnace..... V. E. Edwards  
 Binder leaf holder. Transfer..... I. H. Sisson  
 Binder locking device. Transfer..... I. H. Sisson  
 Binder. Loose leaf..... T. A. W. Tengwall  
 Binder. Temporary or loose leaf..... I. H. Sisson  
 Bit..... F. P. Hall et al  
 Bit brace guide..... J. H. McWeeney  
 Boat motor power..... F. A. Creed  
 Boiler setting..... W. L. Minor  
 Bolster..... J. C. Wands  
 Bolt cutter..... A. L. Moore  
 Bolt lock..... P. J. Wagener  
 Boring or cutting tool holder..... F. H. Loser  
 Bottle..... D. Knowlton  
 Bottle capping machine..... C. L. Du Vivier  
 Bottle filler. Siphon..... C. S. Dolley  
 Bottle neck supporter..... J. J. Cappelen  
 Bottle. Non-refillable..... L. E. Shogren  
 Bowling pin..... B. A. Stevens  
 Brake..... J. E. Berry  
 Brake beam..... 3 pats. S. A. Crone  
 Branding fluid..... T. H. Brown et al  
 Brick..... J. B. Dunlap  
 Brick column die..... C. Schlickeyson  
 Brick cut-off table..... W. Frey  
 Brick cutting and delivering apparatus..... A. P. Steele  
 Brick making machine..... E. H. Janes  
 Bridge bit..... C. Davis  
 Brush..... J. R. Sanford  
 Brush. Hat..... J. Oberseider, Jr  
 Buffing machine..... S. W. Ladd  
 Buggy boot..... M. C. Weiglein et al  
 Bulkhead door..... W. B. owles  
 Calipers. Micrometer..... R. Miller  
 Calipers. Outside..... M. H. Ball  
 Camera. Photographic..... 3 pats. L. J. R. H. 1st  
 Can spout..... F. J. Spiegler  
 Cant hook..... E. Counts  
 Cap and girder support. Combined..... H. Russel  
 Car body extension top..... F. S. Ingoldby  
 Car buffer..... C. Rettig  
 Car coupling..... W. Graupner  
 Car coupling..... G. P. Ritter  
 Car coupling..... W. H. Sanders  
 Car coupling wearing device..... W. F. Gould  
 Car draft attachment..... H. Martin  
 Car grain door. Railway..... D. B. Arnold  
 Car handling and dumping device..... E. Ramsay  
 Car roof..... W. J. McCulley  
 Carbonates and chlorides. Producing..... G. F. Rendall  
 Carbureter..... A. H. Rife et al  
 Card cutting machine..... J. Cornelius et al  
 Carpet fabric. Woven pile..... A. Webb  
 Carriage for track cables..... C. A. Case  
 Cashier. Mechanical..... C. F. Bassett  
 Caster..... A. B. Diss  
 Centrifugal separator..... J. P. Hultgren  
 Chair pad..... E. E. Davenport  
 Chairs. Revolving twin..... G. C. Hawkins  
 Chuck for drills, &c..... H. F. Hagedorn  
 Cigarette wrappers with mouthpieces. Machine for making..... S. D. S. & S. S. D. Rakowitzky  
 Clamp..... E. C. Karl  
 Clay articles. Machine for enameling..... F. Macarthy  
 Cleaning and polishing compound..... P. Levi  
 Clipper. Animal..... A. Hawtree  
 Clock. Alarm..... J. Hauser  
 Clod cutter and pulverizer. Adjustable..... J. P. Hoops  
 Coaster brake..... E. W. Clark  
 Coke oven..... M. E. Rothberg  
 Color exhibiting device..... H. Westfahl  
 Combustion. Device for securing more perfect..... E. Honess  
 Concrete beams, girders, &c. with iron bars inlaid for building purposes. Manufacture of..... H. Siegwart  
 Condenser..... F. Lamplough  
 Condenser..... T. M. Eynon  
 Condenser and heater..... R. F. Platt  
 Conduit sections. Machine for beveling the inner walls of..... R. W. Lyle  
 Cooking apparatus. Steam feed..... M. W. Williams  
 Corn shocking machine knot tying device..... O. S. Ellithorop  
 Cornstalks, &c. Manufacturing products from..... 2 pats. G. R. Sherwood  
 Corn thinner..... H. G. Horn  
 Crate. Collapsible..... W. B. Boutwell  
 Croze. Cooper's..... G. W. M. Delfs  
 Cuspidor..... C. A. Payue  
 Cut off and means for operating same..... D. L. Eustice  
 Developer..... J. G. Dubler  
 Directory. Commercial..... E. S. Brooks  
 Disinfectant distributing device..... S. Hesketh  
 Display rack..... G. A. Weeks  
 Distilling apparatus. Water..... J. F. Chase  
 Distribution system..... J. L. Creveling  
 Doll head..... O. Krampe

Dolly bar..... W. A. Miller  
 Door holder..... J. R. Carroll  
 Door lock..... E. Toth  
 Draft equalizer..... P. J. Grady  
 Dredge..... F. H. Stolp  
 Dredging machine..... C. Sonderegger  
 Drill..... R. J. Brothem  
 Drying cylinder..... C. H. Fish  
 Dust collector..... E. R. Draver  
 Dust pan..... E. P. Wade  
 Dynamo driving mechanism..... J. L. Creveling  
 Earthworks. Apparatus for performing..... F. Pawel  
 Eaves trough hanger..... A. A. Schroder  
 Elbows. Making..... C. Williams  
 Electric battery..... E. R. Gill  
 Electric battery..... M. M. Kohn  
 Electric battery..... V. G. Apple  
 Electric brake..... J. C. Henry  
 Electric brake..... F. C. Newell  
 Electric circuit and polarity indicator..... V. G. Apple  
 Electric current regulation..... C. F. Burgess et al  
 Electric lighting system..... 5 pats. J. F. McElroy  
 Electric train lighting..... J. F. McElroy  
 Electric train lighting system..... J. F. McElroy  
 Electrical distribution. Multiple series system of..... F. H. Loveridge et al  
 Electrical distribution system..... J. L. Creveling  
 Electrical influence machine..... S. Lemstrom  
 Electrical interrupter..... G. P. McDonnell  
 Electrical machines driven by steam motors. Regulating device for..... C. E. L. Brown  
 Electrolytic diaphragm and making same..... H. Rodman  
 Elevator brake mechanism. Electric..... T. W. Eaton  
 Embroidering machine work holding attachment..... J. Henderson  
 Engine cooling device. Explosive..... C. A. Bailev  
 Engine fire box attachment..... W. J. Seavolt  
 Engine igniter. Gas..... L. P. Mooers  
 Engine speed regulator. Traction..... L. Branche, Jr  
 Engine steering gear. Traction..... G. F. Conner  
 Engine stop..... W. H. Dunn  
 Engines. Hoisting mechanism for portable or traction..... F. Bender  
 Explosive engine..... H. W. Tuttle  
 Extension table..... H. Johnson  
 Eyeglass cases. Machine for covering..... E. W. Lindquist  
 Fan..... W. G. Shults  
 Fastening device..... E. Peele  
 Feed water heater..... G. I. Roberts  
 Feeding and band cutting mechanism..... F. S. Rich  
 Filaments of glow lamps. Apparatus for reinforcing and standardizing..... F. Fanta  
 File..... J. Schaeffer  
 File. Separable letter or bill..... H. R. Genisch  
 File. Transfer..... L. G. Schult  
 Filling machine..... R. W. Huss  
 Finder and means for determining focal distances. Combined..... G. N. Pifer  
 Fire escape..... T. B. Barber  
 Firearm..... F. A. Beckwith  
 Firearm. Gas operated..... T. C. Johnson  
 Fireproofing material..... O. Mack  
 Fish and fish refuse. Apparatus for treating..... J. Delattre  
 Fishing tackle..... J. W. Wallace  
 Flanging machine..... D. O. Paige  
 Flash light apparatus..... S. M. Brown  
 Focussing hood..... G. H. Dorr  
 Foundations. Establishing subaqueous..... E. Becker  
 Fruit gatherer..... J. A. Manor  
 Fruit picker..... D. Butler  
 Fuel compound..... H. W. Morrow  
 Furnace charging, controlling, and distributing mechanism..... E. Ramsay et al  
 Furnace fire-arch..... H. A. Poppenhusen  
 Furnaces. Feeding mechanism for billet heating..... V. E. Edwards  
 Furrow opening disks. Equalizing device for..... A. Pederson  
 Game board. Kindergarten..... K. H. Burrows  
 Game of cricket. Table..... C. E. Nicholas  
 Garment rack. Hygienic..... J. F. Messick  
 Garment supporter..... F. Hirsch  
 Gas compressor..... S. E. Alley  
 Gas generator. Acetylene..... W. E. Scofield  
 Gas light..... H. Herz  
 Gas meter..... J. W. Culmer  
 Gas retort..... J. Bueb  
 Gate..... L. V. Buford  
 Gate..... F. F. Jackson  
 Glove..... M. Torrens  
 Golf ball..... F. W. Smith, Jr  
 Governor. Marine engine..... E. C. Buck  
 Governor regulator. Speed..... I. E. Osman  
 Governor speed regulating device. Engine..... R. C. Kimble  
 Grader..... G. Gottlander  
 Grain binder needle..... F. E. Van Loan  
 Grain drill..... F. E. Maish  
 Grain hulling machine..... A. E. Holland  
 Grain rick storm protector..... J. L. McFarlane  
 Grapple..... W. Kirry  
 Grate. Tubular..... F. C. Williams  
 Grease cup..... F. B. Cosper  
 Grinding machine..... J. B. Michael et al  
 Grinding machine. Flat surface..... G. Gorton  
 Gun cleaner..... J. M. Kersey  
 Hair crimper..... N. McCarthy  
 Hair pin. Safety..... A. H. Mosher  
 Hammer. Automatic..... E. H. Swift  
 Handle for trunks, &c..... R. Herrmann  
 Harvester..... E. A. Mainguet  
 Harvester. Grain..... J. F. Steward  
 Harvesting machine..... F. A. Ryther  
 Hasp fastener..... A. Keller  
 Hat pressing and blocking machine..... A. E. Cooper  
 Hay and stock rack. Combined..... S. J. West  
 Headlight. Locomotive..... J. S. Lester  
 Hinge. Water closet seat and cover..... A. F. Blesch  
 Hoist..... W. L. McCabe  
 Holdbach anchor..... J. W. Elstun  
 Hollow ware pressing apparatus..... W. E. Maddock et al  
 Hook or attachment device..... W. C. Peters  
 Horse blanket attachment..... E. C. O'Neil  
 Horse controlling device..... C. E. Corl  
 Horses kicking the stalls of stables. Device for preventing..... T. Laney  
 Hose and garment supporter..... M. Rubin  
 Hub spoke brace. Vehicle..... B. A. Shepley  
 Hydrant..... C. E. Loetzer



Ice cream freezer.....S. Sweeney  
Ice pad or support.....E. G. Johnson  
Illuminating glass structure.....F. L. O. Wadsworth  
Incandescent burner.....A. Rector  
Insect trap.....J. G. Williams  
Insulated ferrule.....H. E. Kern  
Internal combustion engine.....G. L. Straub  
Iron, Structural.....J. Ellmore  
Ironing board, Auxiliary.....R. H. Jackson  
Jar top wrench.....O. Teegarden  
Joining and blank forming machine.....N. E. Brown  
Ladder, Folding.....A. N. Chamberlain et al  
Lamp burner.....L. R. Oakes  
Lamp, Electric arc.....A. Witte  
Lamp, Electric arc.....H. Baggett  
Lamp, Incandescent electric.....C. Panthorier  
Lamp socket, Electric.....M. Norden  
Lamp socket, Incandescent.....H. Hubbell  
Latch, Night.....H. G. Voight  
Lathing for plastering.....J. D. O'Brien  
Lead pigments, Manufacturing.....A. C. J. Charlier  
Level, Spirit.....E. Stowe  
Lever locking device, Hand.....W. W. Tuck et al  
Lighting apparatus.....A. T. Kliegl  
Limit gage.....J. W. Newall  
Linoleum having patterns resembling wood or fabric, Producing.....F. W. Seeser  
Linotype machine.....L. X. Fleck  
Linotype machine.....L. L. Kennedy  
Liquid tank, Annular.....O. Lutze  
Loading device, Automatic.....T. M. Park  
Locket or similar article.....T. Giguere  
Loom.....reissue.....F. Barlet  
Loom dobby mechanism.....H. Wyman  
Loom shuttle box-operating mechanism.....C. Schoen  
Lubricating explosive hydrocarbon engines.....A. F. Lucas  
Lubricator.....G. Wieseckel  
Mail box.....O. M. Aarseth  
Manifolding register.....T. C. Sheehan  
Manifolding register.....R. C. Williams  
Map.....A. von Babo  
Marble shooter.....F. Bucher et al  
Margin gage.....C. H. Lieber  
Marine structure.....E. Becker  
Massage apparatus, Pneumatic.....R. Watson  
Measuring the energy of electric currents, Apparatus for.....W. Stanley  
Mechanical movement.....J. R. Carter  
Metal injecting mechanism, Fluid.....W. L. Lighbown  
Metal mixer, Molten.....J. Kennedy  
Metal oxides, Making.....G. F. Randall  
Metal planning machine.....A. W. Whitcomb  
Meter.....2 pats.....W. Stanley  
Mirror, Transparent.....E. Bloch  
Moistening adhesive surfaces, Device for.....W. J. Weaver et al  
Mold forming machine.....A. E. Hammer  
Mold making machine.....F. W. Hall  
Mountain rope lift.....W. Feldmann  
Mowing machine attachment.....J. P. Monroe  
Musical instrument.....J. Mohr  
Musical instrument.....L. Keinhofner  
Nut, Lock.....W. L. Roper  
Nut, Lock.....H. Minck  
Nut lock.....J. Spena et al  
Nut lock.....R. A. Van Pelt  
Nut lock.....A. B. Harris  
Nut lock, Spring plate.....W. H. Woodworth  
Oil burner, Crude.....J. H. Heffner et al  
Oil burning device.....A. H. Calkins  
Oil supply controlling mechanism.....A. E. Lovett  
Operator's key, Self-indicating.....G. L. Burlingame  
Ore concentrating table lauder.....J. O. Bardill  
Ore discharge for jig tanks.....G. T. Cooley  
Ore loader, Automatic.....T. M. Park  
Ore or coal washer.....N. A. Smith  
Ore roaster.....F. C. Roberts  
Packaging liquids, Means for.....O. H. Castle  
Packing, Engine.....J. Wood et al  
Packing ring for piston rods, &c.....L. H. Martell  
Paper box or carton.....F. D. Cleveland  
Paper clip, Spring wire.....3 pats.....G. W. McGill  
Paper, Means for dissipating electricity in sheets of.....T. C. Dexter et al  
Pen, Marking.....J. La Burt  
Pen support and cleaner and compound for same.....A. Webster  
Pencil sharpener.....W. E. Krouse  
Photographic films, Apparatus for developing, fixing, and toning kinematographic or other.....P. Latta  
Photographic focal plane shutter.....L. Borsum  
Photographic printing apparatus.....N. H. Brown  
Photographic roller blind shutter.....A. L. Adams  
Picture bearing strips, Feeding mechanism for.....C. H. Kayser  
Picture, Shadow.....J. A. Kraus  
Pipe coupling.....E. T. Greenfield  
Pipe coupling joint.....G. F. Bard  
Pipe joint, Metal.....G. H. West  
Pitman connection.....E. W. Burgess  
Plane, Carpenter's.....A. E. Church  
Plant propagating frame.....W. M. Smith  
Planter, Seed.....C. E. Yeager  
Plaster for walls, ceilings, &c. Composition for.....H. M. Hammore  
Playing ball.....F. H. Richards  
Play attachment, Disk.....J. P. Mulrony  
Plow, Garden.....W. O. Davis  
Pliers.....C. M. Schooley  
Pneumatic despatch tube system.....H. J. Hert  
Position finder, Depression.....W. C. Rafferty  
Press.....E. G. Christiansen  
Printer, Roll paper.....J. M. Fox  
Printing and graining machine.....A. H. Sherwood  
Printing apparatus.....R. Herman  
Printing apparatus, Blue.....J. H. Wagenhorst  
Printing or lettering machine.....H. Elmblad  
Printing plate casting and finishing apparatus.....Automatic stereotype 2 pats.....H. A. W. Wood  
Printing plate casting apparatus, Stereotype.....2 pats.....H. A. W. Wood  
Printing plate finishing mechanism, Stereotype.....2 pats.....H. A. W. Wood  
Pulp machine.....E. Hazelton  
Pulp sheets, Apparatus for producing perforated wood.....G. S. Lindberg  
Pump, Measuring.....J. J. Tokheim et al  
Pumps, Pressure regulating device for compensators of direct-acting.....P. F. Oddie  
Pumping apparatus.....J. W. Simmons  
Quarter boot.....C. A. Root

Rail joint.....H. Hanson  
Rail joint.....R. P. Clover et al  
Rail joint.....B. P. Taylor  
Railway brake, High speed.....W. B. Mann  
Railway crossing.....C. A. Moreno  
Railway, Electric.....G. L. Fowler  
Railway rail construction.....J. F. Johnston  
Railway rail, Street.....W. Kuske  
Railway switch, Street.....W. J. Bell  
Recording apparatus.....P. V. Markell  
Recording speech Apparatus for electro-magnetically.....W. A. Rosenbaum  
Register.....P. S. Stauffer  
Relief work, Apparatus for making.....H. Du Brau  
Riding habit, Lady's.....J. G. Muller  
Ring generator.....J. C. F. Malthaner  
Rock crusher concave.....J. D. Spargo et al  
Rocker for chairs, hobby horses, &c.....B. J. Buckman  
Roll housing support.....J. Kennedy  
Rolling mill adjusting screw mechanism.....J. Kennedy  
Rolling mill appliance.....J. Kennedy  
Roof.....J. Ingram  
Rotary drill.....C. H. Haeseler et al  
Rotary engine.....R. May  
Rotary engine.....M. E. Knight  
Rotary engine.....A. Michael  
Rotary engine.....H. Nielsen  
Rotary engine.....A. D. Allen  
Rotary engine, Reciprocating.....F. W. Reeves  
Sack, bag, &c.....Reissue.....A. M. Bates  
Sash fastener.....C. M. Zirkle  
Sash screen fastening.....J. D. Campbell  
Sawmill.....W. E. Jones  
Saw operating mechanism.....J. Meiklejohn  
Saw repairing device.....R. P. Hoadley  
Sawing, beveling, and chamfering machine, Wood.....A. L. Shaw  
Sawing machine.....S. Anson  
Sawing machine, Veneer.....C. W. Talge  
Scale, Computing.....T. L. Tinker  
Scale, Wagon.....B. T. Jr. & J. M. McDonald  
Screw threaded pipe, tube, or rod.....E. T. Greenfield  
Screw threaded pipes, tubes, or rods, Constructing.....E. T. Greenfield  
Sealed folding hollow body.....F. A. Walter  
Sealing device.....D. J. T. Hiett  
Sewing machine.....L. Onderdonk  
Sewing machine, Blindstitch.....5 pats.....L. Onderdonk  
Sewing machine looper mechanism.....4 pats.....L. Onderdonk  
Shade and curtain pole bracket.....E. H. B. Lindhorst  
Shade and curtain pole bracket, Combined window.....C. T. Mitchell  
Shade bracket, Adjustable.....W. S. Heaton  
Shade holder, Adjustable window.....J. D. Campbell  
Shade, Portable folding.....W. F. Lawrenz  
Shade roller.....W. G. Wiesener  
Shaft coupling.....E. C. Griffin  
Sheet metal angle section.....E. G. Charlebois  
Sheet metal siding.....E. G. Charlebois  
Shingle kiln.....J. M. Chapin  
Shoe polisher or inker.....J. Johnson  
Shoe tree.....M. Hayes  
Shutter worker and lock.....J. H. Applegate  
Sieve or bolting machine, Gyration.....D. E. Burner  
Signaling apparatus.....H. S. Hoover  
Singletree hook.....J. W. Overholt  
Skirt holder.....A. & E. C. Serfoss  
Skirt supporter.....R. B. Melanson  
Sleigh runner knee.....H. Blow  
Slicer, Bread, meat, or vegetable.....M. C. Ratcliff  
Smelting furnace, Zinc.....J. P. Cappeau  
Smoke consuming furnace.....C. H. Eddins et al  
Smoking device mouthpiece.....J. E. Blake  
Snap hook.....J. W. Collins  
Snap switch.....W. C. Tregoning  
Snow removing device.....J. A. Manion  
Soap lock.....J. C. Corey  
Socket extension tap.....H. F. Holland  
Soles of boots or shoes or securing together layers of material, Attaching.....L. A. Casgrain  
Spectacles or eyeglasses.....B. T. Trueblood  
Speed changing and reversing mechanism.....C. C. Riote  
Speed regulator.....V. G. Apple  
Sponge.....J. R. & H. Campbell  
Spring locking device.....G. C. Locklin  
Springs, Separable band for leaf.....W. M. Hart  
Stacker, Pneumatic.....C. P. Jensen  
Stake, False top.....J. R. Bowling  
Stall for horses, &c. Portable shipping.....A. Moffitt  
Steam boiler.....J. B. & E. C. Doolittle  
Steam engine.....2 pats.....J. W. Lyons  
Steam generator.....F. O. Wellington et al  
Steam trap.....F. D. Koehler et al  
Steel, Manufacturing.....A. F. Mitchell  
Stereoscope.....A. Schwarz  
Stereotype plate casting apparatus.....H. A. W. Wood  
Stone, Artificial.....W. G. & A. C. Roach  
Stones, Producing artificial.....E. Schwanenberg  
Stool, Music.....F. R. Bennett  
Stove.....J. A. Schulte  
Stove attachment.....E. Jennings  
Stove band, Detachable.....C. H. Bailey  
Stove, Gas.....J. F. & F. O. Adams et al  
Stud.....E. Pringle  
Switch lever staff lock.....T. H. Patenall  
Syringe.....E. B. Wilder  
Table.....J. G. Peace  
Table lock, Pedestal extension.....Reissue.....E. Tyden  
Tackle block.....A. H. F. Straub  
Tag clasp.....S. Dancyger  
Telegraph, Printing.....L. Cerebotani  
Telegraph system.....W. E. Athearn  
Telegraphic system.....J. Doyle  
Telegraphy, Audible electrical.....R. Oxlade  
Telegraphy, Space.....L. De Forest  
Telephone mouthpiece antiseptic attachment.....C. W. Clough  
Telephone receiver holder.....A. J. Briggs  
Telephone system, Central energy.....F. W. Dunbar  
Testing and measuring the strength or resistance of materials, Apparatus for.....C. Fremont  
Thermostat, Incubator.....L. P. Meister  
Threshing machine.....W. H. King  
Threshing machine band cutter and feeder.....A. A. Thomas  
Threshing machine straw baler attachment.....A. J. Spencer

Tie pacing jack.....J. Murray et al  
Tile, Roof.....J. N. Maunton  
Tile setting.....J. H. Munro  
Tiling block for buildings.....V. L. McCuskey  
Time recorder, Workman's.....2 pats.....C. E. Ougley  
Tire, Pneumatic.....F. Toni  
Tire tightener.....O. R. Gould  
Tobacco stemming machine.....J. G. Havens  
Tobacco wrapper and making same.....M. W. Marsden  
Toilet room indicator.....E. D. Allen et al  
Tool, Electromagnetic reciprocating.....C. Marshall  
Tools, Holder-on for pneumatic.....H. S. Covey  
Torpedo, Railway.....M. M. Carr  
Toy.....J. D. Atherton  
Toy, Detonating.....R. S. Wiesenfeld  
Toy gas balloon.....A. J. King  
Toy money bank.....R. E. Lintner  
Train order signal.....H. De Wallace  
Tree support, Expansion standard.....W. Cartwright  
Tree trimmer.....A. M. Lamb  
Trench filler.....C. Elrich et al  
Trolley.....J. Spena  
Trolley, Overhead.....J. J. Bouchard  
Trolley wheel.....T. McWilliams  
Trough carriers, Dumpgate for endless.....J. Petersen  
Tube connection.....J. H. Rosenthal  
Tube handling apparatus.....T. J. Bray, Jr  
Tumbling apparatus.....G. A. Curtis  
Twine holder.....C. J. Lippold  
Type mold.....F. H. Pierpont  
Type writer ribbon mechanism.....J. Alexander  
Type writing machine, 2 pats.....C. W. Walker  
Type writing machine.....J. A. Smith  
Unloading vehicles, &c. Mechanism for.....V. R. Browning  
Upholstery spring.....F. P. O'Brien  
Vaccination shield.....R. W. Johnson  
Valve, Load regulated.....W. B. Mann  
Vehicle brake.....W. L. Post  
Vehicle brake, Electric.....C. J. Specht et al  
Vehicle foot scraper attachment.....C. K. Hunter  
Vehicle life guard, Road.....A. Hudson  
Vehicle, Motor.....C. A. Lieb  
Vehicle spring.....T. G. Stevens  
Vehicle steering mechanism.....F. A. Law  
Vehicle storage brake.....H. Edeline  
Vehicle support, Elastic.....A. Pulbrook  
Vehicle top.....W. F. Lawrence et al  
Vehicle top.....L. Brockmeyer  
Vehicle top prop block.....R. C. Schemmel  
Vehicle wheel.....J. B. Boulicault  
Vehicles, Spark advancing and retarding mechanism for explosive engine.....L. P. Mooers  
Veneering columns.....E. Tyden  
Ventilation of rooms or buildings.....S. Timokhovitsch  
Vessels, Treating metallic.....J. A. Brooks  
Vise, Quick acting.....E. R. Cook  
Vulcanizing apparatus.....W. R. Smith  
Wagon brake block.....P. L. Jones  
Washing machine.....A. N. Verdin  
Water by electrolysis, Apparatus for decomposing.....W. F. M. McCarty  
Water softening, filtering, and purifying apparatus.....T. Waite  
Water wheel, Current.....E. A. Speegle  
Wave motor.....F. H. Reed  
Weighing machine.....F. F. Meyer  
Weir, Automatic.....E. O. Mawson  
Wheel.....W. N. Haring  
Whiffletree clip.....E. B. Welles  
Whiffletree hook.....E. K. Bray et al  
Window screen hanger.....W. H. Fishburn  
Window shelf bracket.....F. M. Hazzard  
Window ventilator and weather shield combined.....S. D. Lewis et al  
Wood carving machine.....B. W. Storey  
Wool fabrics, Making.....J. Tourigny  
Wool lubricant and making same.....G. B. Holden  
Wrench.....M. L. Cochran  
Wrench.....L. Coes  
Wrench and thread cutter, Combined.....C. Benesh  
X-ray apparatus.....E. W. Caldwell  
X-ray tracer.....F. Moritz  
Yoke, Neck.....G. T. Hyde

## DESIGNS.

Candlestick.....E. Bachle  
Spoons, &c. Handle for.....2 pats.....E. Crees et al  
Watchcase.....L. C. Calame

Issued February 24, 1903.

## MECHANICAL PATENTS.

Account carrier.....F. A. Chapman  
Aerating beer, &c. Means for.....E. C. Harvey  
Agricultural implement.....D. Lubin  
Agricultural implement, Power operated.....2 pats.....D. Lubin  
Agricultural machine, 2 pats.....D. Lubin  
Agricultural machine, Motor operated.....L. Lubin  
Air cooler and heater, Cabinet.....J. W. Titus  
Air-tight box, tin, or canister.....A. J. Fogg  
Alloy of iron and titanium.....A. J. Rossi  
Amusement apparatus.....J. Brown  
Anesthetics, Apparatus for administering.....W. A. Heckard  
Animal trap.....C. C. Nesmith et al  
Animal trap.....W. Wilhelms  
Animal trap.....W. M. Bristol et al  
Animal trap.....W. A. Smith  
Automatic trip brake.....E. L. Cridge  
Automobile.....A. W. Yale  
Bag handle.....G. H. Geutzel  
Baking wafers, &c. Apparatus for.....H. W. Mackenzie  
Baling press, Cotton.....W. H. Reeves  
Balls, Manufacture of playing.....F. H. Richards  
Bandage, Hemostatic.....E. E. Denain  
Bank, Transferable job.....G. M. Green  
Barrack jack.....C. Hammond  
Barrel heading press.....W. D. Davis  
Bean separator.....J. W. Carnochan  
Bed or couch heating apparatus.....P. H. T. Paulinetti  
Bedstead caster attachment.....R. Scott  
Bellows.....A. J. Gunter  
Belt, Drive.....I. M. Willie  
Belting, Apparel.....G. H. Taylor  
Beverages, Manufacture of non-intoxicating.....A. Nilson

Bicycle coaster brake.....W. H. McCormick et al  
Bicycle or like vehicle.....C. L. Travis  
Bicycle rest.....E. S. Gamber  
Bicycle seat support.....C. H. Eddy  
Binder, Fodder.....E. Hanby  
Blast furnace.....R. Berg  
Bleaching apparatus, Fabric.....V. Ficquet et al  
Block construction, Hollow.....B. L. Blair  
Boiler head, Steam.....H. Vail  
Boiler superheater, Tubular.....W. Schmidt  
Boiler tube cleaner.....H. C. Ryding  
Bolt clipper.....H. K. Porter  
Bolting machines, Cleaning device for use in connection with.....R. A. Stubbs  
Book, Hymn.....C. Campion  
Boot or shoe edge trimming machine.....W. Thompson  
Bottle, Non-refillable.....P. J. Atzberger et al  
Bottle stopper.....M. Hartog  
Bottle stopper.....J. L. Ruger  
Bottle stopper.....H. Campbell  
Bottle washing machine.....J. A. Prince  
Brake apparatus, Automatic fluid pressure.....M. Corrington  
Brake beam, Trussed.....C. F. Hutton et al  
Brake shoe.....O. M. Stimson et al  
Brick, Adhesive.....W. Hayhow  
Brick machine lubricating device.....C. Chambers, Jr  
Bridle.....H. E. von Kubin  
Broom holder.....W. J. Ashby  
Brush.....W. A. Phinney  
Brush, Polishing.....A. E. Watkins  
Bubble blower.....W. E. Allen  
Bubble blower.....P. D. Horton  
Buckets, Apparatus for automatically discharging.....W. P. Sherman  
Buckle.....reissue.....J. S. Sourek  
Buggy top support.....W. F. Brown  
Building construction.....C. D. Higgins  
Burial case protector.....H. D. Clark  
Button, Collar.....H. Landman  
Buttonhole substitute.....J. Boyle  
Cakes from polygonal blanks, Manufacture of.....J. J. Forster  
Calipers or dividers.....N. E. Martin  
Can folding support.....W. L. Jasinski  
Can conveyor.....H. J. Smith  
Car, Dump.....E. D. Haven  
Car, Dumping.....C. D. Page  
Car fender.....G. E. Wright  
Car fender.....J. Roclandt  
Car fender, Street.....L. Devers  
Car, Motor.....H. Austin  
Car switch operating mechanism, Street.....R. A. Brock  
Car wheels, Manufacturing.....H. C. Buhoup et al  
Car ventilator.....A. T. Fox  
Carburetor.....A. Wolff  
Carriage call box.....J. T. Smith  
Cart protector, Push.....J. W. Heath  
Cartridge, Blasting.....T. F. Durham  
Cartridges, Guide for inside tubes for blasting.....T. F. Durham  
Cash register.....J. H. McCormick  
Casting machine.....W. A. McAdams  
Censer.....B. W. Ahne  
Chain coupling device.....C. H. Smith  
Chain tightening device.....E. J. O'Malley  
Churn.....L. Van Oist  
Cigar lighter.....F. Kraemer  
Cigar tray, Combination.....J. A. Hyle  
Cigarette making machine.....L. B. Baron  
Cinder hopper.....J. Berg  
Circuit breaker.....H. P. Ball  
Clasp.....F. A. Wernig  
Clevis.....H. Westcott  
Clip applicator.....G. J. van Schott  
Clod crusher.....J. G. Finley  
Closet basin seats, Sanitary cover for.....H. W. Leitch  
Clothes wringer.....R. C. Beckman  
Clutch mechanism, reissue.....A. E. Norris  
Coaster brake.....2 pats.....C. Glover  
Cock, Safety gas.....L. Jensen et al  
Coin receptacle.....J. I. Warman  
Coke drawer.....W. S. Jones et al  
Collar, Breast.....G. E. Pratt  
Coloring matter for washable fabrics, Removable.....M. L. Fisher  
Compressor discharge valve.....B. V. Nordberg  
Computing device.....W. M. Wheldon  
Condenser, Injector.....W. H. Coughlin  
Condenser, Surface.....H. Junkers  
Conduits, Apparatus for ascertaining the condition of pipe.....K. E. Stuart  
Conduits, Coupling for conveyors or rods for purposes of underground.....T. J. Cope  
Convertible furnace.....F. Fieberger  
Conveyor, Pneumatic.....J. R. Burgess  
Conveyor support.....C. Metzger  
Copying machine.....F. Soennecken  
Corner plate, Sanitary.....E. Funke  
Corset.....J. H. Thornton  
Corset, Maternity.....M. E. Leighton  
Cotton chopper.....G. C. Talley  
Coupling device.....F. G. Hughes  
Coupling knuckle.....E. C. Washburn  
Crate, Folding.....J. H. Gray  
Crate, Shipping.....H. J. Williams  
Cream separator, Centrifugal.....E. F. & L. J. Hedderich  
Crushing roll.....W. C. Madge  
Cultivator attachment.....O. C. Bateman  
Cultivator planting attachment.....J. H. Hutcherson  
Cultivator, Wheel.....J. A. Smethers  
Curtain fixture.....2 pats.....H. E. Keeler  
Curtain guide, Cabinet.....P. M. Wege  
Damper, Stovepipe.....L. F. Cutten  
Die.....J. C. Forster  
Disinfecting or other purposes, Composition for.....reissue.....H. S. Blackmore  
Display card.....H. Brosius  
Display rack.....J. D. Clark  
Display stand.....F. Simon  
Dock, Dry.....2 pats.....J. F. O'Rourke  
Door check.....J. C. Skidmore et al  
Doors, Manufacture of.....W. D. Plue  
Draft rigging attachment.....H. T. Krakau  
Draw bar equipment.....J. O'Brien  
Drawing board trestle.....L. F. Schilling  
Dress shield attachment.....V. Guinzburg  
Dust collector.....E. R. Draver  
Dust pan.....E. Green  
Dyeing machine.....J. A. Willard  
Electric circuit switch.....J. J. Wood  
Electric controller.....J. H. Holland  
Electric switch.....A. W. Horn  
Electric time switch.....A. W. Lauter, Sr  
Electrical connection binding screw.....G. W. Goodridge



Electroplating apparatus.....J. Walters  
Elevator.....G. W. Kramer  
Elevator brake and governor. Fluid actuated  
.....C. Hoff  
Enameling machine.....H. Claus  
Engine igniter. Gas.....J. Cereghino  
Engines. Vapor feeder and throttle for gas...  
.....E. H. Rousseau  
Eraser cleaner.....R. J. Riley  
Etching apparatus.....J. A. Holmstrom  
Excavating, conveying, and loading ballast.  
Machine for.....reissue.....A. Torrey  
Fan.....2 pats.....W. E. Coleman  
Feeder. Sucking.....M. T. Phillips  
Feeding apparatus. Boiler.....C. Crompton  
Fence post mold.....W. W. Patton  
Fertilizer distributor.....E. L. Braxton  
Fertilizer distributor.....F. L. Atwood  
Fertilizer distributor.....W. Fetzer  
File. Prescription.....J. H. Lytle  
Files, &c. Spring lock attachment for bill...  
.....R. B. Wilson  
Filtering and oiling system. Oil.....F. E. Collins  
Fire alarm system.....B. P. Ketcham  
Fire escape.....W. J. Witham et al  
Firearm support.....R. J. Clyde  
Fishing float.....J. W. Wilson  
Flue cleaner.....H. A. Ruggles et al  
Folding machine.....A. J. Maskrey  
Fork and spoon.....G. G. Smart  
Fruit picker.....A. W. Clark  
Frying pan.....A. Anderson  
Furnace.....C. W. Robinson  
Furnace charges. Apparatus for forming  
blast.....A. S. Dwight  
Furnace charging machine.....S. T. & C. H. Wellman  
Furnace door opener.....E. O. Henderson et al  
Furnaces. Apparatus for preventing top ex-  
plosions on blast.....R. Berg  
Furniture. Combination article of.....J. Moran  
Furniture coupling.....F. L. Forster  
Fuse box.....J. K. Morgan  
Game.....C. H. Crandall  
Games. Appliance for picking up balls em-  
ployed in table tennis or other.....E. A. Jeffreys  
Garbage or other receptacle.....W. Raster  
Garment supporter.....W. S. Hunkins  
Gas burners. Means for packing double jet  
acetylene.....J. W. Bray  
Gas generating and burning apparatus.....  
.....J. C. Teller  
Gas producer.....L. Genty  
Gas tube connection locking device.....I. Lindner  
Gases. Purifying blast furnace.....G. J. Snelus  
Gate.....G. S. Patrick  
Gearing.....J. R. Carter  
Gearing. Belt.....L. Rottenburg  
Gearing. Variable speed.....C. Upton  
Glass polishing machine.....E. J. Hoffman  
Golf ball.....F. H. Richards  
Grain dump and elevator. Portable.....J. Roche  
Grain, &c. Machine for scouring.....  
.....J. H. Peudleton  
Grinding machine.....Z. R. Tucker  
Grinding machine.....L. Passmore  
Guns or cradles. Saddle for.....O. Behnke  
Hair crimper.....M. A. Jordan  
Hand or foot heater. Electric.....A. Zeckenkorf  
Harvester. Beet.....C. E. Bartlett  
Harvester bundle carrier. Self binding.....  
.....J. F. Appleby  
Harvester. Corn.....A. M. Meyers  
Harvester draft device.....C. A. A. Rand  
Harvester. Kafir corn.....M. Bonnell  
Hat pin and fastener.....C. B. Garrison  
Header.....C. W. Harvey  
Headlight.....J. Kirby, Jr  
Headlight. Electric.....J. Kirby, Jr  
Headlight. Locomotive.....H. Reich et al  
Headlight signal.....T. C. Lauer  
Hides or skins. Treating.....S. K. Felton, Jr  
Hinge.....J. Whitehead  
Hinge. Gate.....G. E. Rickel et al  
Hinge. Leaf.....W. M. Gamble  
Hinge. Window blind.....W. C. Landt  
Hoist safety device.....S. S. Wales  
Hoisting apparatus.....A. E. Norris  
Hoisting machine.....J. S. Sheets  
Horseshoe.....J. Griffin  
Horseshoe. Convertible.....F. M. Marney  
Hose supporter.....D. Basch  
Hose supporter.....L. B. Jones  
Hosiery. Manufacture of split foot.....  
.....E. A. Hirner  
Hot air furnace.....R. Schlumberger  
Hub. Vehicle wheel.....G. H. Smith  
Husking machine feeding mechanism.....  
.....I. D. Bate  
Hydraulic cylinders. Controlling device for...  
.....S. W. O. E. C., & H. Hibbard  
Ice and snow melter.....E. L. Tschantre  
Ice breaker.....R. W. Reynolds  
Ice in streets, &c. Machine for cutting up...  
.....C. A. Green et al  
Illuminating structure. 3 pats.....  
.....F. L. O. Wadsworth  
Ink well.....A. L. Carter  
Licking pad.....R. H. Smith  
Iron. Treating molten.....H. Buderus  
Jar.....S. J. Dunkley  
Ladder. Swinging.....E. L. Harmon  
Lamp burner.....A. C. Denniston  
Lamp heater cut-out. Electric.....2 pats...  
.....H. N. Potter  
Lamp. Incandescent gas.....W. S. Proskey  
Lamp socket and fixtures. Incandescent...  
.....P. H. Fielding  
Ledger. Loose leaf.....F. B. Towne  
Lifting jack.....J. T. Haskin  
Lifting jack.....L. O. Henggi et al  
Lithographic press.....R. D. Buncke  
Lock.....W. S. Oberholtzer  
Lock.....H. P. Townsend  
Lock.....W. Schluter  
Lock safety attachment.....E. L. Ruggles  
Log turning mechanism.....W. M. Wilkin  
Loom filling tension device.....B. F. Lee  
Loom shuttle filling carrier.....W. Welch  
Lubricating box for axles of overhead travel-  
ing cranes.....C. L. Taylor  
Lubricator.....L. P. Caloin  
Mail catcher arm.....F. M. Edwards  
Mail deliverer.....F. M. Edwards  
Mail delivering and receiving apparatus for  
railway cars.....R. Shedenhelm  
Mail from cars. Apparatus for delivering...  
.....E. F. Pywell  
Manure carrier.....W. P. West et al  
Manure spreader.....N. P. Hill  
Marking machine.....C. S. McGirr

Mattress. Rubber.....J. Holland  
Measuring instrument.....C. M. Towne  
Measuring tapes. Device for repairing metallic  
.....C. B. Alexander  
Mechanical movement.....C. H. Fuller  
Medicated salt brick.....J. B. Eaton  
Metal. Apparatus for the disintegration of...  
.....M. J. Fuchs  
Metal articles. Wrapping material for pre-  
venting tarnishing of.....F. Flor et al  
Metals. Electromagnet for separating.....  
.....G. H. Young  
Metals, metalloids, and alloys. Producing and  
refining.....E. Straub  
Milk cooler and aerator.....L. Wells  
Molten materials. Apparatus for receiving  
and handling.....P. Danckwardt  
Motion reversing device.....G. E. Tregurtha  
Motor.....O. H. & A. F. Pieper  
Motor.....C. J. Pollock  
Motor.....J. H. Green  
Mouse or rat trap.....H. A. Alston  
Music cabinet.....C. P. Baron  
Musical instrument. Mechanical.....H. M. Smith  
Name finder.....S. M. Thomas  
Numbering or similar machine.....E. G. Bates  
Nut lock.....D. Biggs  
Nut lock.....W. Kellam  
Nut lock.....J. Applin  
Nut lock.....G. H. Bigelow  
Oil burning heater.....P. Dufresne  
Oil can.....T. W. Alexander  
Oil can.....W. A. Reinecke  
Operating table.....C. Lyons  
Ore concentrator.....J. H. Michelsen et al  
Overflow alarm for fluid receptacles.....  
.....B. P. Fortin  
Packing.....C. R. Stein  
Packing. Engine.....L. S. & E. B. Cushman  
Packing material.....G. R. Hayden  
Paint and varnish from woodwork. Compound  
for removing.....O. P. Catherman  
Paper bag machine.....W. Brown et al  
Paper bag machine. 2 pats.....G. Mortson  
Paper box machine.....C. W. Gay  
Paper clip.....P. C. Lawless  
Peanut grinding mill.....A. W. Straub  
Pen. Fountain.....A. Eberstein  
Penholder.....W. C. Modisett  
Phonograph repeating action.....E. Gilman  
Phosphates. Making citrate soluble.....W. Wolters  
Photographic objective.....P. Rudolph  
Photographic printing apparatus.....  
.....H. W. Herrman et al  
Photographic printing frame.....H. W. Herrman et al  
Picture machine. Moving.....W. P. Warren  
Picture nail.....T. C. Richards  
Picture support.....G. C. Lore et al  
Pipe joint and valve in connection therewith...  
.....T. W. Moran  
Pitman connection.....J. R. Carter  
Plow. Ditching.....A. Pinion  
Plow. Sidehill.....L. A. Davis  
Plow. Sod turning.....W. N. Fletcher  
Pocket protector.....H. C. Dexter  
Poke. Animal.....W. R. Evans  
Potato digger.....P. Brown  
Power from car axles. Device for transmit-  
ting.....D. E. Johnson  
Press mold.....J. J. Forster  
Printing apparatus. Fabric.....F. A. Arbenz  
Printing machine.....J. H. Reinhardt  
Printing or graining machine.....A. H. Sherwood  
Printing press gripper.....F. I. Macaulay  
Projectile.....C. V. Wheeler et al  
Pulley rim section.....F. Phillips  
Pulp machine.....M. W. Marsden  
Pulp strainer.....P. Reinicke  
Pump.....W. H. Westerman  
Pump. Cattle.....C. E. Griffith  
Pump-head.....H. M. Etter  
Pump. Rotary.....J. B. C. Lockwood  
Pumps, air-brakes, compressors, or the like...  
.....Diaphragm.....E. B. Rayner  
Putting tool.....F. Egert  
Radiator air valve.....F. W. Leuthesser  
Rail brace.....T. A. Griffin  
Rail joint.....F. S. Pascoe  
Rail joint and chair. Combined.....H. Kunkel  
Rail joint and cross tie.....W. T. McBride  
Rail tie.....W. T. McBride  
Railway signal device.....C. E. Baker  
Railway signal. Electric.....E. B. Cutten et al  
Railway switch.....A. K. Brantner  
Railway switch. Street.....W. J. Bell  
Railway tie. Metallic.....C. F. Fisher  
Railway track structure.....H. B. Nichols  
Range. Coal and gas.....H. Chevola  
Ratchet wrench.....M. J. West  
Receptacle. Non-refillable.....H. W. Avery  
Reel holder.....W. McDougall  
Reflecting structure.....F. L. O. Wadsworth  
Reflectors. Adjustable means for mounting...  
.....J. Kirby, Jr  
Revolving furnace.....S. S. Barger  
Rodent exterminating device.....J. B. Boylan, Jr  
Rolling mill feed table.....J. Kennedy  
Rolling mill feed tables. Manipulator for...  
.....S. T. & C. H. Wellman  
Rolling mill feed tables. Manipulator for...  
.....C. H. Wellman  
Rolling tubes.....4 pats.....M. Mannesmann  
Rolling tubes. Machine for.....M. Mannesmann  
Rotary engine.....C. C. Smith  
Rounding machine tool.....D. F. Shea  
Rug. Traveler's.....G. A. & A. Strom  
Ruler and line gage.....S. Adler  
Safety pin.....P. H. T. Paulinetti  
Sail.....J. Couch  
Sash fastener and lock.....G. B. Pickup  
Sashes and frames. Adjustment for metallic  
window.....J. L. Boyd  
Sawmill carriage set works.....A. Cunningham  
Sawmill set works.....L. J. Hanhart  
Schedule holder.....C. F. Pidgeon  
Scraping tool.....E. P. Golden  
Sene. Pursing.....W. F. Harris  
Sewing and trimming machine. Overseaming...  
.....F. Malsch  
Sewing machine guide.....A. Merkel et al  
Sewing machine needle.....G. A. Manwaring  
Shade fixture.....S. Stewart  
Shade fixture. Adjustable window.....D. S. Dow  
Shade holding device.....C. L. Hopkins  
Shaft for bolting or other machines.....  
.....A. G. Mather  
Sheepdips. Making.....F. S. Clark et al  
Shelf support.....P. M. Wege  
Shirt waist retainer and conformer.....  
.....F. E. Thompson

Shoe. Ankle supporting corset.....  
.....J. J. Lattemann  
Shoe tree.....M. S. Hess  
Shoes. Machine for cutting articles from the  
inside of.....W. S. Fultz  
Shutter fastener and setter.....H. J. Mohlenhoff  
Signal and trumpet. Combined.....  
.....F. L. Chamberlin  
Silo.....J. P. Christensen  
Siphon filler.....2 pats.....C. M. Earl  
Skin holder.....T. King  
Skirt supporter and skirt waist holder. Com-  
bination.....A. M. Brown  
Sleigh attachment. Vehicle.....W. L. Williams  
Slug strip.....N. P. Coburn  
Smelting.....E. Knudsen  
Snow plow.....J. W. Russell  
Sower. Broadcast hand seed.....E. C. Smith  
Speed indicator.....2 pats.....C. E. Kelly  
Speed regulator.....H. P. White  
Spinning, twisting, winding, balling, or like  
machinery. Filer for.....C. S. McCannan  
Spooling machine.....C. Seidel et al  
Square. Framing.....H. A. Bankston  
Stacker drum. Hay.....P. E. Sner  
Stacker. Pneumatic.....J. K. Sharpe, Jr  
Stall.....H. Locke  
Stall. Portable.....G. B. Buckingham  
Starch. Making lump.....J. M. Lyman  
Steam boiler.....E. Ward  
Steam trap.....F. D. Koepfer et al  
Stirrup. Safety.....J. A. Whelan  
Stoker. Automatic.....J. P. Luckett  
Stopper retainer.....C. A. Tatum  
Store service apparatus.....C. W. McCormick  
Stove.....J. J. Konigs  
Stove. Condensing gas.....T. Bamforth et al  
Stove oil burner.....C. H. Higgins  
Stump protector.....J. F. Rowley  
Suspenders.....2 pats.....H. C. Hine  
Suspenders and belt. Combined.....I. Beaver  
Swing.....D. B. Speer  
Swivel.....S. M. Wells, Jr  
Table fork.....M. V. B. Stinson  
Tank band fastener.....P. H. Bruinekool  
Tank heater.....A. Hamilton  
Teeth. Rack for holding false.....O. E. Wall  
Telegraph. Facsimile.....E. E. Kleinshmidt  
Thermostat.....J. M. Latimer  
Threshing machine tooth.....R. L. Nellis  
Threshold or door sill and storm protector  
Removable.....S. W. Funk  
Tile plate.....B. Wolhaupter  
Tile fastener.....H. B. Skeele  
Time recorder. Workman's.....D. Hepp  
Time recorder. Workman's.....A. L. Jaynes  
Tin plate cleaning and polishing machine.....  
.....W. McCord et al  
Tire fastener.....H. G. Wilson  
Tires. Outer cover for pneumatic.....J. Butler  
Tobacco leaf hanger.....W. W. Smith  
Tool holder for planers, &c. Adjustable.....  
.....G. H. Kleinert  
Tools. Machine for relieving fluted.....  
.....B. M. W. Hanson  
Track attachment.....W. H. Crossley  
Transformer.....O. J. Depp et al  
Trolley. Overhead.....J. E. Byers  
Trolley pole reverser for electric tramways...  
.....F. E. Ward  
Trolley track switch. Overhead.....P. F. Werner  
Truck.....S. M. Vanclain  
Truck. Elevating.....B. F. Broyles  
Trunks, &c. Shield or protector for.....  
.....C. E. Duggan  
Truss.....H. T. Prange  
Tube expander.....J. S. Stevens  
Tubes. Elongating.....M. Mannesmann  
Twisting head.....A. Taste  
Type bar making machine.....M. Reid  
Type writing machine.....W. C. Richardson  
Umbrella handle. Adjustable.....F. M. Sears  
Unloading device.....T. S. Miller  
Valve. Balanced slide.....J. Clayton  
Valve. Blow off.....E. H. Lunken  
Valve gear. Steam engine.....J. T. Thompson

Valve or faucet. Tap.....S. S. Bromhead  
Valve. Reducing.....L. Brennan  
Valve regulator. Needle.....H. C. Howells, Jr et al  
Vamp stay.....A. W. Rockwood  
Vapor generators. Draft apparatus for port-  
able.....H. Howard  
Vault construction.....J. J. Walter  
Vehicle.....J. P. & T. E. Murdock  
Vehicle brake.....L. House  
Vehicle spring.....S. H. Frost et al  
Vehicle wheel.....R. L. Morgan  
Vehicle by means of springs with compressed  
air. Device for the suspension of.....  
.....A. Stoequart  
Vessel bottoms. Device for cleaning.....  
.....E. S. Willey  
Vessel hawser attachment.....R. C. Reavley  
Vise. Bench.....F. J. Wermes  
Washing device.....H. Graham  
Watch regulator.....O. F. Engwall  
Water meter and boxing.....H. V. Garretson  
Waterproof material and preparing same.....  
.....C. I. Goessmann  
Wave or tide motor.....C. Caille  
Weather vane.....R. Wilson  
Weighing machine. Automatic.....E. Schenck  
Wells. Device for raising liquids from.....  
.....T. F. Moran  
Wheel holding machine.....J. D. Smith  
Whip socket.....I. D. Cady  
Windmill.....J. J. Pearson  
Windmill.....J. D. Huson  
Windmill regulator.....W. H. Riggs  
Wire fabric making machine.....P. A. Reid et al  
Wire stay making machine. 2 pats.....  
.....J. Kelley et al  
Wire stretcher and cutter.....H. E. Herrick  
Wire tie. Cross.....A. N. Edeburn  
Wire tie fastening tool.....A. N. Edeburn  
Wrench.....J. H. Hobson

## DESIGNS.

Furniture pedestal or leg.....J. Keppler  
Furniture support and back.....J. Keppler  
Furniture support and leg.....J. Keppler  
Furniture support and upright.....J. Keppler  
Glass vessel.....W. Eggington  
Medallion.....W. A. Malliet  
Monument.....F. E. Twiss  
Tile covering for floors, walls, &c.....J. K. Sierer

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inven-  
tions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washing-  
ton, D. C.

Foreign patents may also be obtained in cer-  
tain other countries.

**FREE!** Send us 2 cents to pay for postage and we will mail you a valuable copyrighted book, "How to obtain Patent, Caveat, Trade-Mark and Copyright Protection, with Decisions in Leading Patent Cases" entirely free of charge. Address: **INVENTIVE AGE PUBLISHING COMPANY,** (Dept. P.) **WASHINGTON, D. C.**

## Attention Inventors!

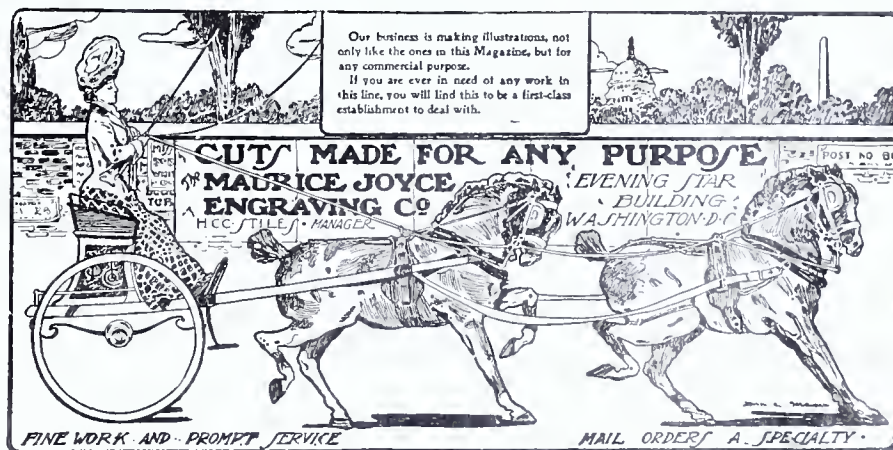
## LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

Charge, fifty cents to one dollar, depending on size of list.

In ordering, please state class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.





# A Remarkable Offer

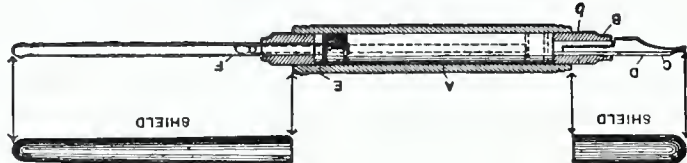


## The "POST" SELF FILLING FOUNTAIN PEN.

No Filler. No Soiled Fingers. No Lost Time. Simple and Perfect.

### THIS IS ITS CONSTRUCTION

IT IS AWAY AHEAD OF ANY OTHER PEN MANUFACTURED BECAUSE OF ITS SELF-FILLING AND SELF-CLEANING FEATURES.



BEING THE ONLY ONE MANUFACTURED HAVING THESE CONVENIENCES.

We will send this famous pen, postpaid, and one years subscription to "The Inventive Age," for \$2.00.

Every Inventor in the country needs The Inventive Age, and everyone needs a pen. Here's your chance to get a bargain.

There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the "Post" has secured. We have testimonials that a million dollars could not buy. In the list will be found leading men in politics, finance, law, religious movements, literary men, bankers and business men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the "Post" and in terms of praise simply unqualified. Send for list of testimonials.

Address: **THE INVENTIVE AGE Publishing Co.** 918 F St. Northwest, Washington, D. C.

### Our Great Popular Offer!

...A...

## Complete Electrical Library

By PROF. T. O'CONOR SLOANE.

...A...

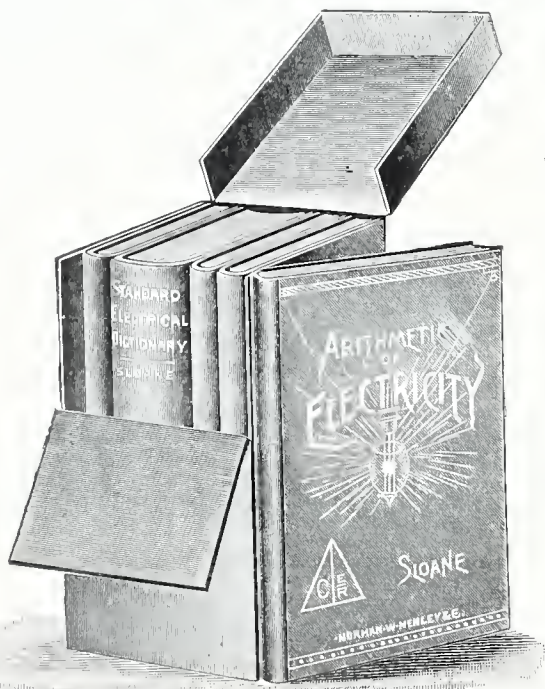
\$7.00

Library

for

\$5.50.

Comprised by  
the following  
books:



5 Volumes,

1300 Pages,

Over 450

Illustrations.

Electricity Simplified	Price 1.00	Our Great Special Offer.—We will send prepaid, the above five volumes, handsomely bound in blue cloth, with silver lettering, and enclosed in a neat folding box, as shown in the illustration, at the Special Reduced Price of \$5.50 for the complete set. The regular price of the five volumes is \$7.00
Arithmetic of Electricity	1.00	
Electric Toy Making	1.00	
How to Become a Successful Electrician	1.00	
The Standard Electrical Dictionary	3.00	

Order direct from us while the opportunity lasts. Any of the above books sold singly at the published prices. You save \$1.50 by ordering the complete set from us. Sent prepaid on receipt of price. Remit by draft, postal money order, or express order.

Address: **THE INVENTIVE AGE Pub. Co.,** 918 F Street, N. W., Washington, D. C.

## MECHANICAL MOVEMENTS, Powers, Devices and Appliances:

By Gardner T. Hiscox, M. E. Price \$3.00.  
Author of "Gas, Gasoline and Oil Engines."

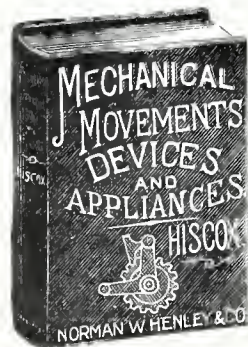
Large 8vo.

Over 400

Pages

Handsomely

Bound in Cloth.



1,649 Specially  
Made  
Illustrations  
With Descriptive Text.

PRICE, \$3.00

A DICTIONARY of Mechanical Movements, Powers, Devices, and Appliances, embracing an illustrated description of the greatest variety of mechanical movements and devices in any language. A new work on illustrated mechanics, mechanical movements, devices, and appliances, covering nearly the whole range of the practical and inventive field, for the use of Machinists, Mechanics, Inventors, Engineers, Draughtsmen, Students, and all others interested in any way in the devising and operation of mechanical works of any kind.

Sent to any address on receipt of price.

Address: **INVENTIVE AGE Pub. Co.,** 918 F. St., N. W., WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

*THE Inventive Edge* AND  
*PATENT INDEX.*

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR.  
No. 4.

WASHINGTON, D. C.---APRIL, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

- - - A PORTABLE CUBICAL-BOX - - -  
CONCRETE MIXER.

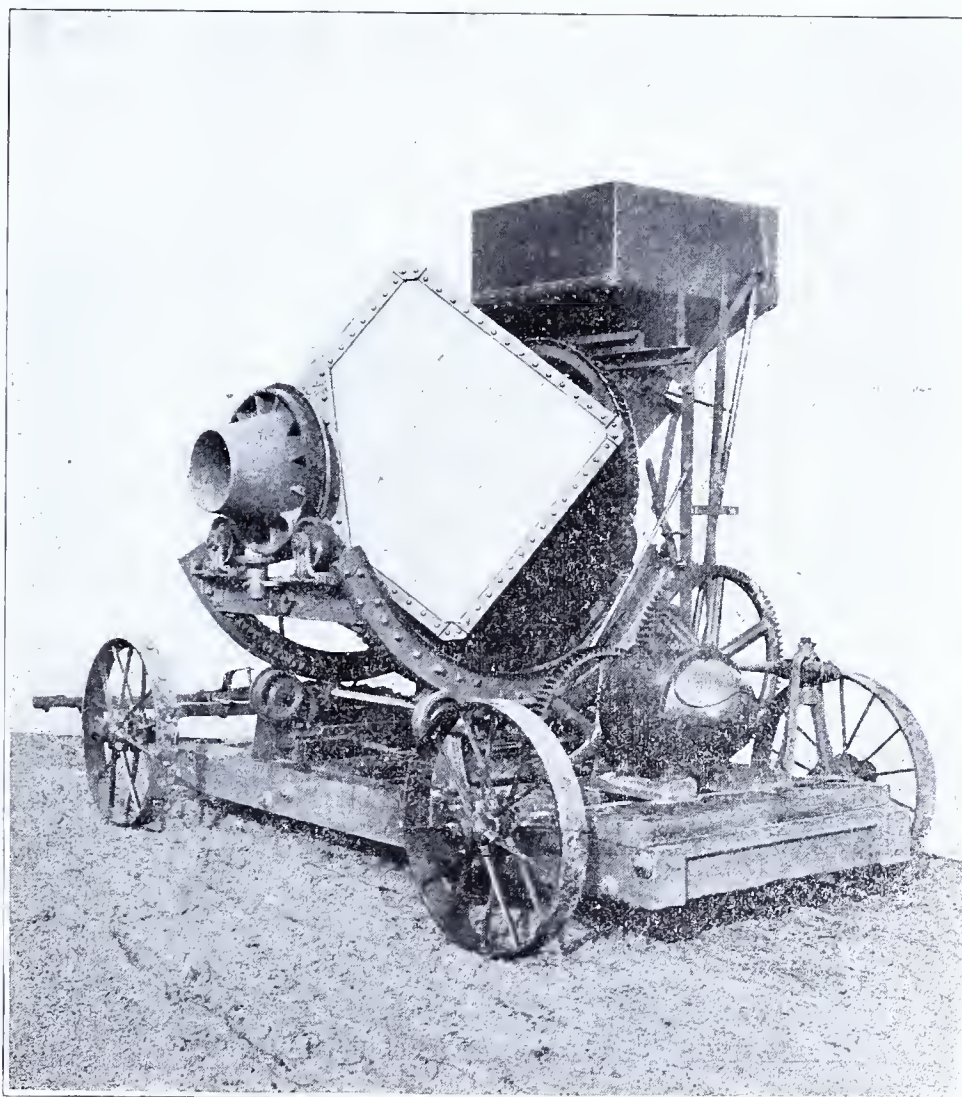
THE accompanying illustration represents a new style of portable concrete mixing machine, which is now being introduced by the Municipal and Engineering Contracting Company, Manhattan Building, Chicago, Ill. The cement is mixed in a perfectly formed cubical box having two of its corners truncated to form open trunnions and to provide feed and discharge openings. The cubical box, which is continuously rotated during the operation of the machine, revolves on rollers of an arcuate frame, which is provided with a pair of steel rockers supported by flanged antifriction wheels of the main frame of the machine. The arcuate frame, which is open, as shown, is adapted to be oscillated, and the steel rockers, which are provided at their inner faces with rack bars, are connected at their ends by cross pieces, upon which are mounted the rollers for supporting the trunnions of the conical box. A pair of upright rollers is arranged at each end of the oscillatory arcuate frame, and the hollow trunnions of the cubical box are flanged to engage the inner faces of the rollers. Each cross bar of the arcuate frame is also provided with a central bearing bracket having an upright bearing for the reception of the shaft or spindle of a horizontal roller or wheel, which is arranged between the upright rollers to receive the bottom of the hollow trunnion. This centrally arranged horizontally disposed antifriction roller or wheel is engaged by the flange of the hollow trunnion and is adapted to sustain the end thrust of the same.

The rack bars, which are provided at their lower edges with teeth, mesh with pinions located beneath the arcuate frame and keyed or otherwise secured to a horizontal shaft, which extends longitudinally of the main frame of the machine at one side thereof. The power shaft, which is located at the opposite side of the main frame of the machine, extends longitudinally thereof and is connected by spur gearing with a motor and by sprocket gearing with the hollow trunnion at the inner or rear side of the cubical box. The hollow trunnion at the rear of the cubical box carries a large sprocket wheel, which is driven by an endless sprocket chain. The motor, which is located at the rear end of the main frame, is connected by spur gearing with the power shaft and with the shaft that carries the pinions for actuating the rack bars. A suitable clutch mechanism is employed for controlling the gearing of the latter shaft, which is thrown into operation when it is desired to empty the cubical box. When the pinions are rotated, the rack bars are moved longitudinally to oscillate the

arcuate frame and swing the front hollow trunnion of the cubical box upward or downward. The box discharges at about an angle of thirty-five degrees, and is rotated while discharging, so that the entire charge of concrete passes quickly through the discharge opening.

A cubical box has long been recognized to be the most effective concrete mixer known, and its only objection, the time heretofore lost in charging and emptying it, has been eliminated in the present machine, which is continuously operated during the charging, mixing and discharging periods. The mixing effect of the cubical box is increased by arranging the corners out of alignment, and when the box revolves at the rate of fifty revolutions per minute, the material is thrown across it in the form of an extended sheet, thereby thoroughly intermingling the ingredients and producing the highest grade of concrete.

It is of the utmost importance that the concrete be supplied with the proper amount of water, and this can be ascertained only by observing the concrete while it is being mixed. The large openings formed by the truncated corners of the cubical box, are located at the front and back of the same and afford a clear view of the interior of the cubical box and the contents thereof. The machine is furnished with an automatic loading hopper which admits of the use of a superhopper, not attached to the cubical box but automatically coupled and uncoupled therefrom as the operator may desire to dump the box or return the same to its normal position. In connection with this movable hopper, means are provided for swinging it away from the mixing receptacle when it is desired to tilt or tip the latter from its receiving to its discharging position, and such means also automatically bring the hopper into co-operation relationship with the mixing receptacle when the latter is brought from its discharging to its receiving position. When the mixing receptacle is in position to receive materials from



the superhopper, the automatic loading hopper will hang in position to couple or connect the same and will discharge into the former. The time required to mix a batch of cement is about two minutes, and the box can be tilted and completely dumped in about ten seconds.

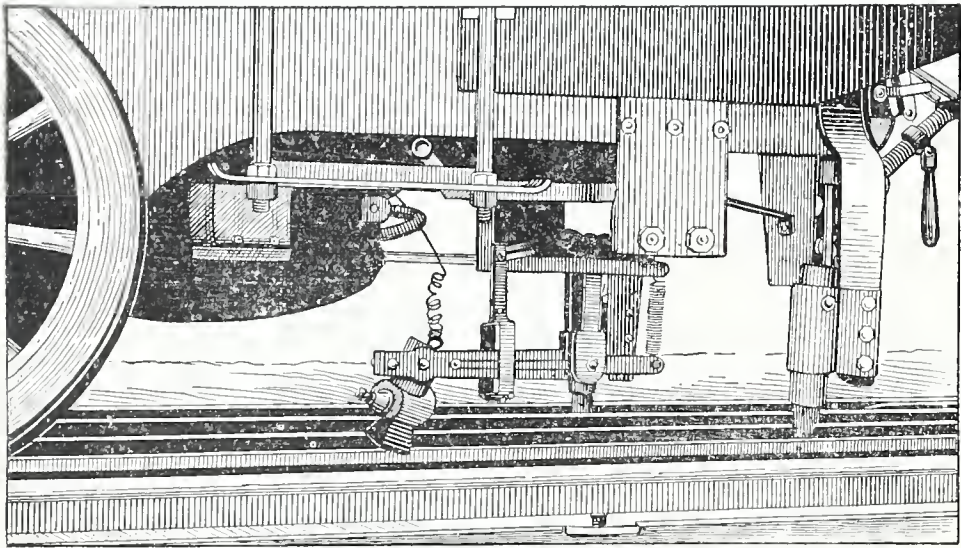
The machine is manufactured in four sizes having capacities of one-half yard, twenty feet, one yard and two yards per batch, respectively. The first three sizes are usually mounted on trucks and the other machine is intended for stationary plants and is mounted on skids.



## NEW SAFETY DEVICE FOR RAILWAYS.

ON the 12th of November, a new electrical device for preventing collision between railway trains was tested with entire success in the presence of a board of experts on one of the State lines near Frankfort, Germany. Since any improvement which

Goldstein, and a translation of the official report will illustrate concisely the working of the apparatus. Two locomotives, numbered respectively 290 and 1420, had been equipped with the new device, and the experiments proceeded as follows: Engine



THE THIRD RAIL AND CONTACT SHOE.

can effectively reduce the danger of accident in railway travel appeals so directly to popular interest, and our people have been shocked by the occurrence of several disastrous wrecks quite recently, it has been deemed timely to submit a brief account of this new device, which seems to mark an important advance step in the solution of a difficult and perplexing problem.

It is the joint invention of Messrs. Hubert Pfirrmann and Max Wendorf, and its construction and method of operation are as follows: Midway between the rails is laid a light third rail of the ordinary T pattern, the joints of which are so connected as to form a continuous conductor.

Midway under the forward part of the engine is hung the working instrument, an electrical apparatus inclosed in a square case or jacket occupying a cubic foot of space. The instrument is connected with a contact shoe, which slides along the third rail, and by wires with a telephone and electric alarm bell in the cab of the engine driver, and a red incandescent lamp which is lighted by the same impulse that rouses the alarm bell into action. A further improvement of the device sets the electric brakes on the engine or entire train simultaneously with the alarm signal which sounds the bell and lights the lamp. The apparatus is so adjusted and arranged that the engineer can at any moment, by touching a lever, satisfy himself that it is in full working condition.

The tests were conducted on the main line from Frankfort to Hanau, between the stations Sachsenhausen and

290, drawing a special train and approaching Sachsenhausen at full speed, received the danger signal and came to a full stop: the driver of 290 then asked by telephone the cause of the signal and received from the keeper of a grade crossing, half a mile in front, word that a wagon had broken down in crossing the track and

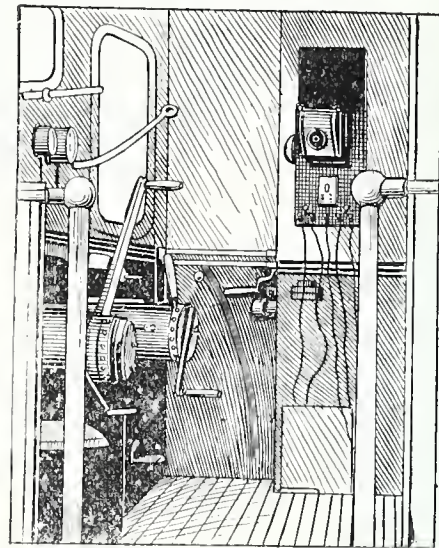
obstructed the line. After ten minutes' wait, the engineer of 290 received word by telephone that the obstruction had been cleared away and thereupon resumed his trip.

A mile farther on, the signal on 290 again sounded, and the driver was in-

formed by telephone as before, that the semaphore around a curve and more than half a mile distant was set at "halt." Thereupon engine 290 slowed down and proceeded cautiously, sounding its whistle at short intervals, the telephone bell in the drivers' cab ringing continuously until the curve was rounded, when the ringing ceased, notifying the engineer that the semaphore had changed to "track clear." Thereupon 290 resumed full speed.

In the tests to prevent collision, engine 1420 came up rapidly from behind and on the same track as 290, which had slowed down and was proceeding cautiously in consequence of reported danger in front. The moment that 1420 came within 1,093 yards of 290, the signal on both engines began to ring and their red lights to glow. Thereupon 1420 halted, the driver inquired of 290 in front the cause of the alarm, and a complete understanding between the two trains was immediately established. An important point in this connection is that in practice the same warning signal is sounded upon every engine equipped with the apparatus which is on the same track and within the prescribed radius—a kilometer or a mile, as the case may be—from the engine and train which cause the obstruction. If a semaphore be falsely set at safety, the train may run past it into a block in which another engine is halted or moving with perfect security that warning will be given in ample time to prevent a collision under any

driver of every train into instantaneous touch with other trains, switchmen, and station and crossing keepers in his neighborhood, and keeps ever before his eye and ear an automatic and infallible signal which springs into activity the moment that his locomotive, whether running forward or backward, comes within the radius of danger from collision. What ghastly wrecks might be spared, what precious



TELEPHONE ALARM BELL, AND RED LIGHT IN ENGINE CAB.

lives saved, what a sense of added security given to multitudes of railway travelers, what delays avoided under certain atmospheric conditions, by a device which puts the man behind the headlight, rushing on through night and fog and storm, into instant and unerring touch with the train next in front and with those whose duty it is to watch and guard the safety of the line! That the present invention is



ENGINE 290, EQUIPPED FOR EXPERIMENTS AND SHOWING THIRD RAIL.

and all conditions of darkness, fog, storm, or mistaken instructions. The invention has other minor points of usefulness, but the foregoing will be sufficient to indicate the general method of its operation and the measure of its efficiency. In effect, it puts the engine

yet perfected and fully adapted to practical use is not to be prematurely assumed; but, in the judgment of those whose opinions are entitled to respect, the way has been pointed out and the germ of a new and effective system discovered.



## THE UTILIZATION OF WASTES AND BY-PRODUCTS IN MANUFACTURES.

WITH SPECIAL REFERENCE TO THE DECADE OF 1890-1900.

By HENRY G. KITTREDGE, of the Census Bureau.

### PART VIII.

In the manufacture of cotton very little waste remains unutilized, but there have been great improvements of late in the methods for its more successful utilization for refabrication, instead of being simply used for carpet linings, wadding, and batting. Nearly all cotton rags, and the same may be said of the linen rags, constitute valuable materials for the manufacture of paper. It is very difficult to destroy by mechanical means the physical identity of the cotton fiber. F. L. Simmonds in his "Waste Products and Undeveloped Substances," goes so far as to remark that--

In this utilizing age it can not reasonably be expected that a waste product, such as rags, which have been proved to possess a length of staple, when broken up, sufficient for the spinning of common stuff, will be much longer permitted to find its way exclusively to the paper mill. Like flock and shoddy, linen and cotton rags will be taken more and more from the paper maker, and raw vegetable fibers will have to be sought for or cultivated.

A large portion of the waste made in cotton mills, that is, such waste as has too short a staple for spinning, is used for such articles as batting and wadding. For this purpose 10,567,000 pounds were used during the census year of 1900, valued at \$864,016.

#### COTTONSEED OIL INDUSTRY.

Closely allied to cotton manufacturing is the cotton-seed oil industry, in which there has been a great revolution within late years in the utilization of the cotton-seed, in obtaining most valuable commercial by-products, that were at one time allowed to go to waste with the seed in the form of manure. Cotton-seed was a garbage in 1860, a fertilizer in 1870, a cattle food in 1880, and a table food and many things else in 1890.

The manufacture of cotton-seed oil and all of its resultant by-products furnishes one of the best examples of the development of a business based upon the utilization of waste product.

The seed of the cotton plant, of which cotton oil is the fatty ingredient, was for many years a waste product of the cotton field. The first cotton-oil mill was established in 1837, but for many years after, the business did not amount to much; in fact, the real advances in this industry have been made in the past twenty years, with the greatest development in the last ten years. Prior to the advent of the oil mill and during the interval of its development, cottonseed was used in some localities as a fertilizer. Later on it was used to a certain extent as a cattle food; but the main proposition seems to have been how to get rid of the seed with the least trouble, and, in fact, laws were passed in certain states making it a punishable offense for ginnermen within certain limits of towns to allow cottonseed to lie around and rot, or to dump it into streams.

It is computed that as late as 1870 only 4 per cent of the seed produced

(from a cotton crop of 3,011,996 bales) was utilized in the oil business. In 1890 this had increased to 25 per cent of the seed on a crop of 7,472,511 bales, and in 1900 it was 53 per cent on a crop of 9,645,974.

According to the census of 1900, the value of the entire cottonseed crop was 13.8 per cent of the total value of the cotton crop, including the value of the seed, while the value of the products from the manufacture of all the seed produced would have been 20.4 per cent of the total value of the cotton crop. Thus it will be seen that the full benefit of the cotton-seed product to the planting and commercial interests of the South is not yet fully realized: not within \$26,000,000 on the size of a crop equal to that in the census year of 1900. The seed which is not worked up in the oil mills is used for fertilizing, feeding, and planting. It has been unquestionably demonstrated that for feeding and fertilizing purposes the product of the cottonseed, after expressing the oil, has a greater economical value than does the whole seed; so that eventually the entire seed crop will be worked through the cotton-oil mills, with the exception of the amount reserved for planting.

The seed-cotton is brought from the fields to the ginneries, and there the fiber is removed, leaving adhering to the seed a short fiber, known as linters, the removal of which is the first process through which the seed passes in the oil mill, after the seed has been cleaned of trash, boll, etc.

Cottonseed as it comes to the mill has a waste, due to sand, trash, etc., amounting to from 1 per cent to 3 per cent. The clean seed consists of about 2 per cent of linters, 48 per cent of hulls free from lint, and 50 per cent meats. These figures vary with different seasons and different localities, but they show the average of a number of localities and seasons.

The process of separating the different component parts of the seed is practically a continuous one. At the mills the seed is received into large houses and there distributed by means of conveyors and elevators to different parts of the shed or to the mill proper. All seed is thoroughly cleaned of bolls, trash, nails, etc., before going to the delinting machines. These consist of fine revolving saws closely set together, which tear off the short fiber left on the seed as it comes from the regular cotton gin. This product of the oil mill, known as linters, varies considerably as to quality and the quantity obtained, depending upon the seed worked. The average amount of linters taken from a ton of cleansed seed is from 20 to 30 pounds. It is of fairly good color and is used largely in the making of mattresses, felt hats, pillows, etc.

The seed, after passing through the

delinting machines, is run through the hullers, which cut the seed so that when dropped upon the shakers and passed through the beaters the meats are thoroughly separated from the hulls. A ton of seed yields about 1,000 pounds of hulls. Perhaps one of the greatest developments in the business during the past few years is the utilization of these hulls for cattle food. Previously they were considered a great nuisance around the mills, and in order to get rid of them the mills used them for fuel, the ashes being utilized for fertilizers, as they contain a large amount of potash. The feeding of the hulls is being recognized more and more every day, and from this has come a demand which has resulted in the baling and shipping of the hulls to great distances from the source of their production. There have also been developed, although not to any great extent as yet, processes for removing the fiber from the shell of the hull and making a fine paper stock from it, utilizing the bran in making mixed cattle food.

The separated meats pass from the shakers to rolls, where they are crushed, and from there they pass to cookers, where they are cooked to break up the oil cells. The cooked meats are then inclosed in camel's hair mats and placed in hydraulic presses and subjected to a pressure of 2,000 to 4,000 pounds. The resultant crude oil is then pumped into settling tanks and certain impurities are allowed to settle out. The residue left in the press, after expressing the oil, is in the form of a hard cake. This is a most valuable by-product of cottonseed oil and amounts to about 725 pounds per ton of seed. The cake, either in the form of cake or after having been ground into meal (known as cottonseed meal), is used largely as a cattle food, or in the form of meal directly as a fertilizer, or as the principal ingredient in many prepared fertilizers. It is the best cattle food and fertilizer of any of the vegetable-oil cakes produced.

Cottonseed meal contains, by a large percentage, a greater amount of nitrogen (protein) than any other food. It is, in fact, the most concentrated, cheapest, and most nutritious of foods, and in feeding, mixing it with bran, middlings, hulls, or other feeds, it produces an ideal cattle food. The tendency of the times is toward more scientific feeding, and the utilization of cottonseed meal, with its high percentage of flesh-forming properties, makes a great advancement over the old method of feeding the whole seed.

The foregoing products are all incidental to the production of crude cottonseed oil. The crude oil is allowed to stand in settling tanks for a number of hours, and is then ready for the refining process. There is obtained from a ton of seed approximately 275 pounds of crude oil. The oil varies in quality considerably, depending upon the condition of the seed and the locality from which it comes. It will vary in color from a light brown to a deep black. It contains varying proportions of red coloring matter and free fatty acids, depending upon the care with which the seed has been handled and the oil produced. The free fatty acids will vary from 0.4 per cent to as high as 30 per cent, but the average is in the neighborhood of 2 per cent.

The real advancement of the last twenty years in the cotton-oil industry has been made by the refinery. While there have been many improvements in the machinery of the crude oil mills, the process is to-day practically what it was many years ago; but when we turn to the refinery, the tremendous strides which have been made in the improvement of the refining methods result in a product so superior to the article produced years ago, that industries utilizing the oil, on account of this improvement, can use greater quantities of the oil than ever before.

Crude cottonseed oil, after its first

process of refining, comes out in the shape of a clear, brilliant, yellow oil, known as summer yellow oil, having a specific gravity at 15° Centigrade of .92. Owing to the deterioration of the seed and to inferior methods of manufacture, all crude oil does not produce yellow oil of the same grade. The trade has classified summer yellow oil as choice, prime, off, and soap oil, the difference in these grades being in the color and flavor. Choice oil is a light lemon-colored oil, without any suggestion of red, and is mild and neutral in flavor. Prime oil is slightly darker in color and sweet in flavor, without any seedy flavor. These two grades are used for edible purposes. The off and soap grades of oil are reddish in color and the flavor is very poor, due to bad seed, mustiness, etc. This oil is used for mechanical and soap purposes.

As intimated before, the amount of the different grades of oil produced depend largely upon the condition of the seed. It has varied from about 85 per cent to 35 per cent of choice and prime oil, and from 15 per cent to 65 per cent of off and soap oil.

With the improved refining methods of the past ten years has come increased demand and use for refined cottonseed oil. Summer yellow oil forms an important basis for a number of different products after being submitted to various processes, such as bleaching it to make it white and pressing it to extract the stearin.

One of the principal uses and development of cottonseed oil contingent upon the improvements in refining methods in the past decade is that of the manufacture of lard compound—a mixture of lard, oleo, stearin and refined cottonseed oil—making a most palatable and economical food. Another product of cotton-seed oil, white cottolene, is a mixture of oleo stearin and especially processed cottonseed oil, marking, perhaps, the highest development of cotton oil as a food product.

Cotton oil is also used in the making of salad oils, packing sardines, in the oleomargarine industry, for miners' burning oil, cathedral burning oil, tempering oil, oil for heavy tool-cutting machines, mixing with putty, and, while not exactly a drying oil, yet for rough painting the crude oil can be and is used to a considerable extent. The cheapness of cotton oil compared with other fats, as well as its excellent soap-making properties, has caused it to be largely used by soap makers, both in America and abroad. It is also used in the manufacture of washing powders. Cottonseed oil is used to-day to a great extent by bakers. It is also used as a substitute for olive oil. Chemists and physicians now recognize cotton oil as a high-class food product.

In the refining process there is produced a loss amounting on an average to about 10 per cent of the crude oil. This forms an important by-product of the cotton-oil industry. This substance is known as soap stock, or foots. It has a fat acid content of from 40 per cent to 50 per cent, and is composed of free oil, coloring matter of the crude oil, and soap caused by saponification in the process of refining. It is used in making wool-scouring soaps and cheap grades of laundry soaps. It makes a most excellent soap. There is also produced from this substance glycerin, candle stock, olein, still pitch, etc. The number of uses of this last, though by no means least, by-product of the cotton-oil industry emphasizes the many uses to which this oil and its various products are put. It is of course impossible here to elaborate upon these, or even to fully enumerate them.

It should be borne in mind in dealing in or describing cottonseed products that in no two seasons are the conditions exactly alike, and the quality and quantity vary so much, that it makes it a constant study and a most interesting business.



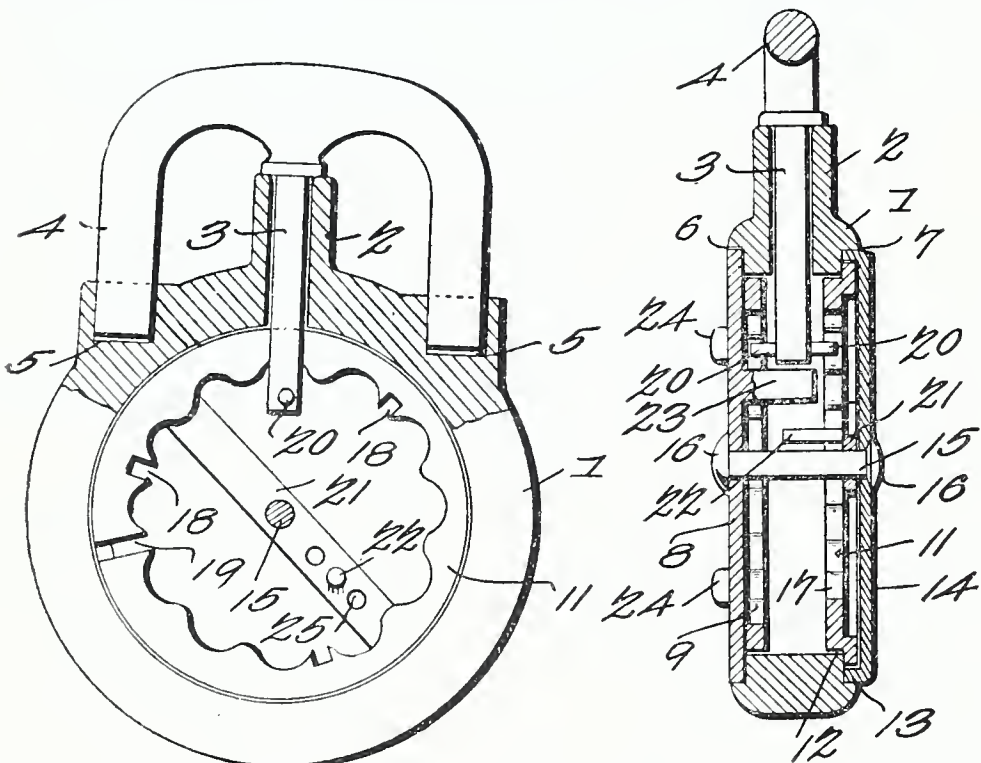
# CLEVER NEW PATENTS.

Permutation Padlock.—Tunnel Roof.—Chocolate Cutter.

## Permutation Padlock.

A unique permutation padlock has been devised and patented by Mr. Irwin Williams, a well-known inventor residing in Nelson, Mo. Referring to the accompanying cut, the frame of the lock is designated by the reference numeral 1, the same being substantially circular in form and provided at its upper portion with a tubular extension 2, constituting a guide for the bolt 3, which is carried by a two-armed shackle 4, the terminals of which normally rest in recesses or sockets 5, formed in the upper portion of the frame, and are thereby positively held against turning. The frame, which is an annulus, is provided at its front and back with seats 6 and 7, respectively, the seat 6 being engaged by the combination-dial 8, to which is secured in any preferred manner the rotary tumbler 9. The periphery of the flange 10 does not extend to the wall of the seat 7, and in the recess thus formed, is fitted an intumed flange 13 of the back plate 14, the plate and dial being permanently associated with the frame in this instance by a bolt 15, the ends of which are upset, as at 16, thus preventing the parts of the lock being detached without destructive force being applied thereto.

The rotary tumblers are flat ring-like structures, the inner walls of which are disposed eccentrically to the axis of rotation, and are provided with a plurality of depressions 12, and with a plurality of slots 18, one of which, 19, is the releasing-slot. The releasing-slot of the front tumbler is on the narrow side thereof and on the back tumbler on the broad side thereof, this disposition being employed to heighten the difficulty of picking the lock. The depression 17 and slots 18 also operate to confuse a person attempting to pick the lock.



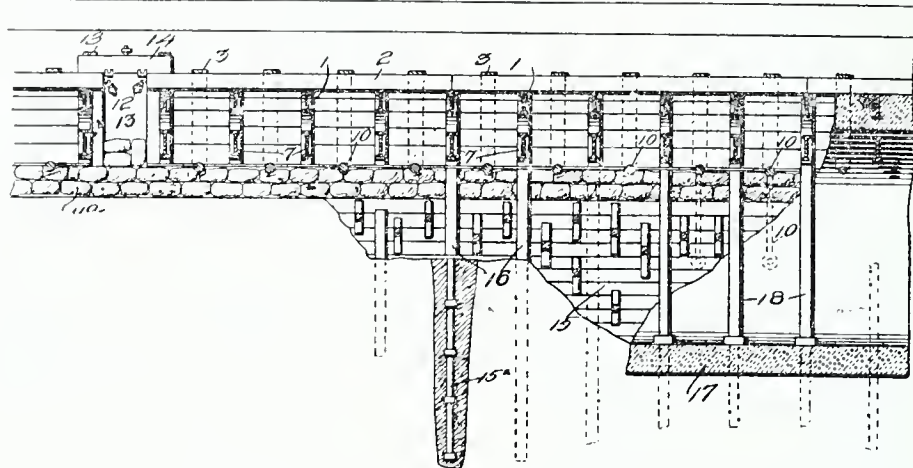
The back tumbler carries a bridge 21, to which is secured a pin 22, adapted to be engaged by a lug 23, carried by the inner side of the dial-plate, the co-action between the pin and the lug operating, when the combination is known, to bring the releasing-slots opposite the locking-lugs 20, and thus release the shackle. The dial-plate is provided on its outer side with a plurality of lugs 24, by which the dial may be turned, and the dial, as well as the frame adjacent thereto, is graduated and laid off into numbered divisions in the usual manner.

To unlock the padlock, the operating-dial is first turned to the right to bring one number on the dial opposite a mark on the frame, and this effects setting of the back tumbler, and the dial is then turned to the left to another known number, thereby setting the front tumbler, and when the releasing-slots are thus brought into alignment, the locking-lugs will pass therethrough and release the shackle, which may then be turned to one side and free the lock from the staple.

## Tunnel Roof.

Mr. James C. Meem, of 305 Ocean Ave., Brooklyn, N. Y. has patented a tunnel-roof and has assigned a one-half interest in his invention to the Borough Construction Co., of Brooklyn. The object of the invention is to provide a structure which will in a ready, feasible and thoroughly practicable manner eliminate the danger of cave-ins attendant upon building tunnels, subaqueous or underground. In the arrangement shown, the structure is composed of ribs or compression members 1, constructed of steel beams spaced apart at suitable intervals and bent on the desired segment of a circle. Upon these ribs are laid longitudinally-disposed wooden arch members 2, which may, if preferred, be spiked or bolted together, the whole being made up into suitable lengths or sections—say of from one to two hundred feet each. The section is bound together laterally by rods or eyebars 3 passing over the arch as bands, and underneath as tension chord members and being retained under suitable tension either by tourniquets or turnbuckles. Connecting the terminals of the ribs 1 are chord stiffeners 7, which may be held associated with the under side thereof by brackets. In use, the bottom of the river or other body of water is first dredged to a suitable depth, and a foundation 11a, preferably of concrete in bags, is laid to occupy a position beneath the edges of the shield. The shield in sections of suitable length is then floated to position and lowered to approx-

imate line and grade, previous to which, however, pulley-blocks are fastened to the forward end of the shield, by means of which the next section of shield may be guided to position. At intervals of from one hundred to five hundred feet, or as desired, bulkheads are constructed between the abutting ends of two sections, between which when in position sufficient room is left to fill the space with concrete or clay to insure a tight joint in the event of using compressed air, the bulkhead being covered by a mattress of arch-timbers, the other abutting joints being covered with a heavy felt or steel covering, and over the entire shield when thus positioned a covering of clay and sand is deposited to keep out water from above and, if used, to keep in air below. If this covering be shallow, barges loaded with pig-iron may be sunk temporarily across the shield to hold it down while the arch is progressing from beneath. From adjacent shafts, connection is then made with each end of the shield and the excavation begins. If the underlying material be rock, the excavation may pro-



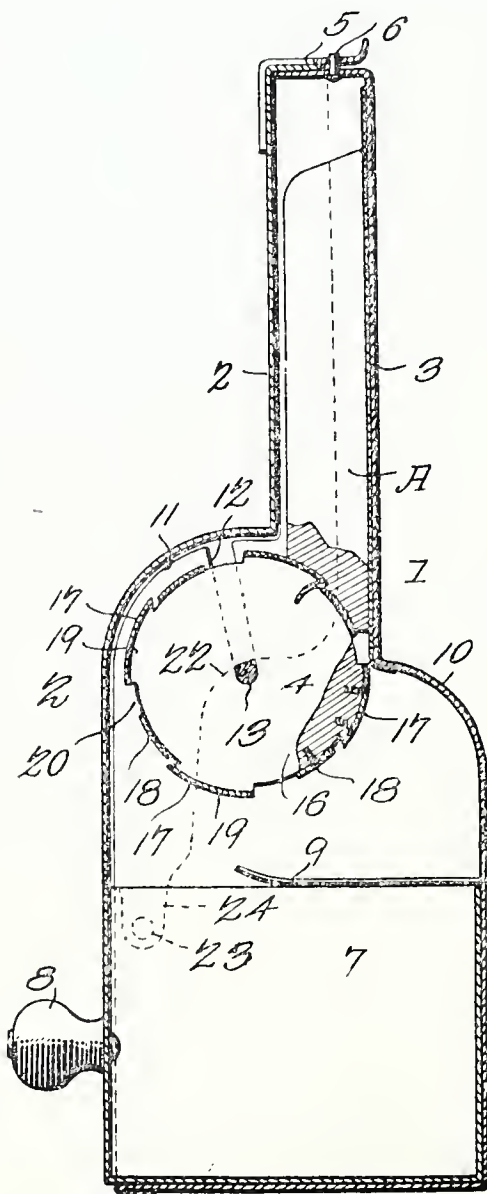
ceed as an open cut, air being used, if necessary. If the said material be ordinary clay or solid earth, the work may also proceed as an open cut, care being taken to sheath the sides to hold the supporting-foundations. If, however, the ground be soft or treacherous, compressed air may be used, and the work may proceed as follows: side drifts will be run out adjacent to the edges of the arch, and at intervals of, say, five feet, casing-pipe 15a in suitable lengths will be sunk to the required depth and filled with concrete, and the shield will be temporarily blocked up thereon, as at 16. The central shaft is then run out for a short distance to the full depth, and in the bottom a section 17 of foundation is laid, and from this the shield is again supported by stanchions 18 while the sides are being excavated. As the sides are brought up, the draft-bars 10 may be separated, and dropped to be built into the masonry and be made a part thereof, thereby to transmit a part of the weight of the tunnel to the side foundations and also hold the shield in place. If preferred, the chord-stiffeners may be removed.

By the employment of the shield of this invention greater security results to the workmen building the arch and opportunity is afforded for examining the character of material and to arrange suitable foundations as the arch progresses. Further, in case of ordinary soil or rock underlying the bottom, the tunnel may be built close to the surface, thereby reducing the depth of the tunnel correspondingly inshore.

## Chocolate Cutter.

Mr. J. F. Wynkoop, of Minneapolis, Minn., has patented a novel and very useful chocolate cutter, which will cut or shave chocolate from the cake, and is so constructed that the cutting mechanism will cause the cake to be drawn downwardly upon the same, thereby obviating the necessity of supplemental feeding means. As will be seen by reference to the accompanying cut, a casing is employed having a contracted upper end or hopper which will snugly enclose a cake of commercial chocolate. The lower portion of the casing is enlarged, and a drawer is slidably mounted therein to receive the material after it has been cut. Above this drawer and at the lower end of the contracted portion, is a revolvable cutter in the form of a drum having a plurality of knives 17, and an exposed operating handle. The front upper half 2 of the casing is hinged as shown in the dotted lines, so as to permit the insertion of the chocolate cake and the removal of the cutting drum if desired. In use, the lower end of the cake rests upon the drum and the knives cut diagonally downward through the same, thereby shaving off thin slices and at the same time automatically feeding the cake downwardly.

Mr. Wynkoop is an old inventor, who has made a success out of all his patents, because he knows how to handle them himself and does not depend on others.





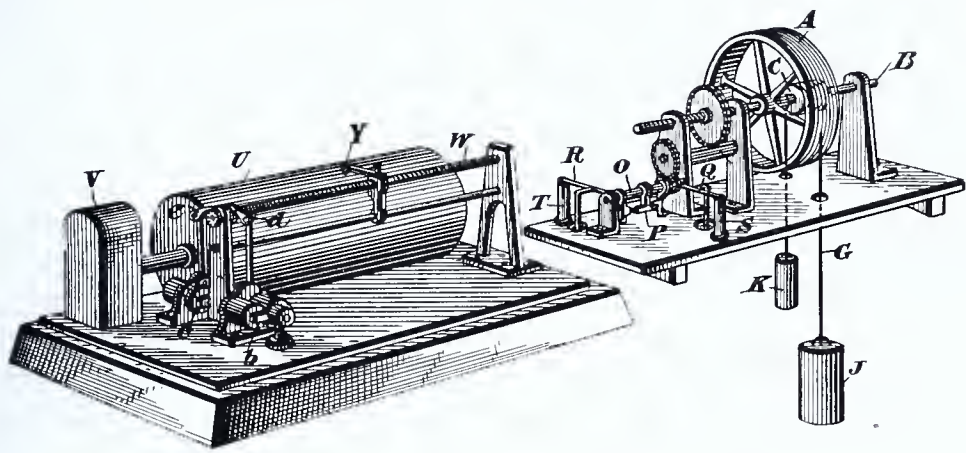
## AUTOMATIC ELECTRIC RIVER GAGE.

The automatic electric river-gage shown in the accompanying illustration was recently invented by observer W. M. Fulton, of Knoxville, Tenn., and has been installed in the river at Chattanooga. The apparatus consists of two instruments, one to be located at the river to be operated by the rise and fall of the water, and the other at a suitable point more or less remote from the river, where the observations are taken. The main pulley *A*, about eight inches in diameter, is mounted on a shaft *B*, which also receives a small pulley *C* about one-inch in diameter. One end of the shaft is threaded and screws into a suitable support, and threads of a corresponding pitch are provided at the peripheries of the pulleys *A* and *C*. A small brass spring wire *G*, which is wound around the pulley *A* in the threads thereof, passes down through a small hole in the base of the instrument and is attached to a float *J*. A counterpoise *K* is suspended in like manner from the small pulley to maintain the wire *G* at the proper tension.

opposite direction, the pendent bar which has hitherto been idle is brought into action and the other spring is operated.

The float *J* moves in an iron casing attached to the base of a pier or other support and the counterpoise is suspended inside of a short iron pipe. The recording instrument is provided with a drum *U*, which is rotated by a clock *V*. A pen *Y* is carried by a nut, which is operated by a threaded shaft *W* and guided by a rod. Electromagnets *b*, *c*, operate pawls *d*, *e*, which engage ratchets of the shaft *W*. The ratchets are reversely arranged, and the pawls operate in a manner similar to a clock escapement and thus avoid the possibility of moving the ratchets more than one tooth at a time.

The gage is operated over a metallic circuit consisting of three wires running from the river to the recording instrument. One wire passes through both of the mercury cups, thence through the battery, and then connects with one end of the wire in each set of magnets *b*, *c*. The other two wires



When the float *J* rises, the counterpoise *K* will unwind the wire from the small pulley and take up the slack in the wire *G* of the large pulley *A*. The threads of the shaft cause the latter to move the pulleys transversely and thereby maintain the wires in proper position with relation to the openings of the base of the device. The shaft *B* is connected by a train of gears with a small shaft *O*, which makes one complete revolution when the float moves through a distance of one tenth of a foot.

From each end of the shaft *O* is loosely suspended a bar of about three inches in length provided with a crescent shaped cam, and a *T*-bar *P*, which is fixed to the shaft *O*, is provided at its ends with thin strips and plays between the pendant bars. When shaft *O* is rotated in one direction, one of these thin strips is pressed away from the *T*-bar by the pendent bar, with which it comes in contact, and thus passes such pendent bar, while the other metal strip is pressed against the *T*-bar by the other pendent bar and is enabled to raise the same. As soon as the latter is raised slightly beyond a perpendicular position, it falls of its own weight. In falling, the cam on the face of the bar presses down the end of one of the projecting springs *Q*, *R*, and plunges a small platinum wire into a cup of mercury. When the shaft *O* is rotated in the

connect with the posts *S*, *T*, respectively, and with the other ends of the magnet wires. When the water in the river changes a tenth of a foot, the float *J* operates the shaft *O*, causing one complete revolution of the same and closing the electric circuit long enough to move one of the pawls and thus change the position of the pen on the record sheet, which is wound around the drum *U*. The pawl *d* operates when the river is falling and the other pawl operates when the river is rising. The pen *Y* moves to the right when the river rises and to the left when it falls.

## Photographs on Fruit.

Apples upon the surface of which are perfectly reproduced the photographs of the Emperor and Empress of Russia and of the President of the French Republic have been shown in France.

Before photography was employed, images were produced by means of figures cut from paper and stuck on the surface. When the paper was removed, the image appeared light and the fruit dark, or vice versa, according to the manner in which the paper was cut and applied.

At present, however, photographs are reproduced with all their details. Strong negative electrotypes are employed, having great resistance and reproduced on thin films. The films are obtained by photographing the subject many times. The film is held in place by two rubber rings, or is stuck by some matter that will not obstruct the rays of light, such as albumen or the white of an egg.

## IMPORTANT COURT DECISIONS.

## DECISIONS OF THE U. S. COURTS.

## Supreme Court of the United States.

CARY MANUFACTURING COMPANY *v.* ACME FLEXIBLE CLASP COMPANY.

*Decided January 5, 1903.*

1. WRIT OF ERROR IN PATENT SUITS—COURT OF APPEALS FINAL.

Judgments and decrees of the circuit court of appeals in all cases arising under the patent laws and under the criminal laws are final, and therefore a writ of error to the Supreme Court in such cases cannot be maintained.

2. RIGHT OF APPEAL—CONSTITUTIONAL QUESTION—ELECTION OF REMEDY.

Where a party might be entitled to come directly to the Supreme Court from a judgment involving constitutional rights, *Held* that if he does not do so and carries his case to the circuit court of appeals he must abide by the judgment of that court.

## Supreme Court of the United States.

CLINTON E. WORDEN & COMPANY *v.* THE CALIFORNIA FIG SYRUP COMPANY

*Decided January 5, 1903.*

1. TRADE MARK—"SYRUP OF FIGS"—DECEPTIVE.

"Syrup of Figs" as a trade-mark or trade-name for a medical preparation containing no appreciable amount of the syrup of figs, *Held* to be deceptive and not entitled to protection as a property right.

2. SAME—SAME—TRADE NAME—FALSE SUGGESTION.

The contention that "Syrup of Figs" although not a technical trade-mark may be protected as a trade-name describing the article overruled because it contains a false suggestion.

3. SAME—SAME—DESCRIPTION OR DECEPTION.

Even if the juice of figs was at first so largely used in the compound called "Syrup of Figs" as to make that term descriptive, *Held* that there was no justification for continuing the use of that term after the manufacturers and venders of the medicine ceased to use fig-juice as a material ingredient.

4. SAME—SAME—DECEPTION SHOWN BY POPULAR BELIEF.

The publication by the complaint of articles stating that the medical properties of its compound "Syrup of Figs" were derived from senna and not the juice of figs, *Held* insufficient to avoid the charge of deception, since the

popularity of the medicine was due to the popular belief that its essential ingredient was the juice of figs.

5. SAME—FALSE ASSERTION—PROPERTY RIGHT CANNOT BE MAINTAINED.

Where any symbol or label claimed as a trade-mark is so constructed or worded as to make or contain a distinct assertion which is false, no property can be claimed in it, and the right to the exclusive use of it cannot be maintained.

6. SAME—FRAUDULENT REPRESENTATIONS BY COMPLAINT—INJUNCTION REFUSED.

Where the defendant sold a medical preparation named, marked, and packed in imitation of the complainant's medicine for the purpose and with the design and intent of deceiving purchasers and inducing them to buy defendant's preparation instead of the complainant's, *Held* that an injunction would issue if it were not for the fact that the complainant has so fraudulently represented to the public the nature of its medical preparation that it is not entitled to equitable relief.

7. SAME—QUACK MEDICINES—RIGHT OF PROPERTY THEREIN.

In the absence of legislation limiting and controlling traffic in so-called "quack" medicines prepared by others than registered physicians, *Held* that the courts cannot declare dealing in such preparations to be illegal nor the articles themselves to be not entitled as property to the protection of the law.

## Artificial Diamonds.

"M. Moissan has already obtained very small diamonds," says Cosmos, "by heating carbon under very high pressures. Several chemists have endeavored to extend his experiments and to produce stones of commercial size. It is well known that they are employed in large quantities in drilling, and this would probably be their chief use. Doctor Ludwig, of Berlin, describes in the Chemiker Zeitung some new experiments made by him along this line. He heated carbon in an atmosphere of inert gas, in an iron flask raised to a high temperature by the electric arc. Bits the size of a pea were obtained, having the hardness and the crystalline form of a diamond. The crystals had a gray tint that makes them worthless for jewelry, but their use in drills would seem to be promising."—*The Literary Digest*.

## PATENTS

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-TWO YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

## INVENTIVE AGE

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

E. G. SIGGERS, 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Jesse M. Waltom, Stephenville, Texas. Planter.—The planter of this invention is provided with a rotatable hopper mounted between the carrying wheels, which are arranged to yield vertically to prevent obstructions from interfering with a continuous operation of the hopper. The supporting wheels are provided with journals, which are carried by vertically movable bearings, and the latter are slotted to receive guide pins of the frame of the planter. The seed dropping hopper is carried by the wheels.

William A. Byerly, Bridgewater, Va. Gate.—In gate operating devices for opening and closing a swinging gate at a distance from either side of it, difficulty has been experienced in causing the gate to complete the opening or closing movement, especially with that class of gates in which the upper and lower hinge joints are thrown out of alinement to cause the gate to move by gravity, and in many instances it has been found necessary for the operator to hold the mechanism until the gate has completed its movement. Mr. Byerly has invented an ingenious locking device for holding the operating mechanism until the gate has completed its opening or closing movement. The operating mechanism is then automatically released to permit the gate to be again operated.

James E. Guinn, Inventor, Lebanon, Mo.; H. A. Clark, assignee of one-half interest, Thayer, Mo. Draft Rigging.—This improvement in draft rigging enables all the strain to be applied directly to the adjacent truck, and in rear of the body bolster, instead of in front of the same, as heretofore. The body bolster is provided with upper and lower members, and the draft timbers are connected to and embraced by the members and also extend in advance and in rear of the body bolster. A filling block is located between the draft timbers, and is also embraced by the members of the body bolster. A strong and durable connection between the rigging and the body bolster is thus provided to prevent the former from falling upon the track, should the connections between the draft timbers and the frame of the car become broken.

Amos G. Cox, Inventor; Amos G. Cox, Rowan Cooper and A. G. Cox Manufacturing Company, assignees, Winterville, N. C. Cotton Seed Planter and Truck. Two patents.—The cotton-seed planter, which is adapted to level the ground and prepare the land for receiving the seed, is provided in front of the seed box with a shoe having a throat, beneath which operates a depressible gage. The gage serves to smooth the walls of the furrow, and its sides are concaved inwardly somewhat on the lines of the ordinary plow-share presenting a sharp nose. The nose operates in conjunction with the sides of the gage to deflect the loose soil and evenly distribute the same on each side of the furrow.

The novel feature of the truck resides in the draft mechanism, which is connected both to the axle and to the platform or body of the truck to distribute the strain between both parts. A draw bar having upper and lower members is employed, the lower member being rigidly connected with the axle, and the upper member being secured to the platform or body by the king bolt. The upper member, while being fastened to the platform or body, is adapted to move with the lower member, and a firm brace is thus provided for relieving the axle of

severe strain and for preventing the king bolt from bending or breaking. The front axle may be turned quickly in any direction, and the truck itself may be turned within its length.

Charles J. and Charles C. Quinn, Scranton, Iowa. Four patents. Stock Waterer, Chimney Tops and Calf Weaner.—The first invention relates to that class of waterers which are applied to a barrel or other reservoir, and will automatically supply water to the drinking compartment as rapidly as it is taken therefrom by an animal, so that the trough will always be properly filled. The receptacle in the present instance is made up of spaced drinking compartments, and an intermediate float compartment communicating therewith. One wall of the receptacle has an upstanding lug provided with an opening to receive a fastening screw or bolt, by means of which the trough may be attached to a reservoir and cannot turn. A supply tube projects from the trough and is screw-threaded to receive holding nuts, this supply tube being arranged to pass through the barrel or reservoir and having on its inner edge a perforate cap. In the outer end of the tube is arranged a peculiarly shaped valve seat and chamber, and a plug valve mounted therein is operated by a swinging float arranged within the float compartment and protected from injury by being completely enclosed.

The second and third inventions consist of chimney-tops which are designed to supersede the galvanized iron hoods commonly employed for supporting a smoke pipe upon a chimney. The main objection to the galvanized iron hoods is that they soon rust or rot away, and are not attached to a chimney in a stable manner, so that they soon become loose under the strain of the smoke pipe, and result in loosening the bricks and mortar of the chimney. Mr. Quinn has provided simple and effective means for clamping the chimney top or cap in position upon a chimney irrespective of the size or contour of the same. The chimney top or cap has a flat plate to fit the top of a chimney, and adjustable clamps are mounted on the plate for engaging the walls of the chimney. In one patent the clamps engage the walls at the center, and in the other patent the clamps lock at the corners of the chimney. Both constructions are capable of withstanding all the strains incident to the use of a smoke-pipe-supporting chimney cap. The chief merit of these inventions lies in their very low cost, great strength and adaptability, without change, to any chimney.

The fourth invention relates to a calf weaner which is capable of operating automatically to cover the mouth of an animal when it lifts its head, and is adapted to similarly uncover the mouth when the head of the animal is lowered for grazing. The calf weaner is provided with a stiff muzzle or basket of wire, and a flexible harness is employed for attaching it to an animal. The muzzle is strengthened by braces, which are extended to form projecting prongs. The harness pivotally supports the muzzle, which hangs over the mouth of the animal by its own weight, and when the animal attempts to graze, it comes in contact with the ground and swings upward freely. The device is ingenious and fully accomplishes the purpose for which it is designed.

Turner H. Nance, Talladega, Ala. Three patents.—Mr. Nance who is one of the successful inventors of the south has recently obtained three patents. The first is on a melting ladle intended for reducing babbitt or like metal to a molten state. A suitable bowl is employed having oppositely disposed lips and a projecting handle. Upon the outer end of the handle is arranged a stationary grip, while another grip is slidably and revolvably mounted between the stationary grip and the bowl. In the bottom

of the bowl is placed a novel wick which is arranged to be saturated with suitable hydrocarbon. A support for the ladle comprises a standard sharpened at one end so that it may be driven into the ground, the other end being adapted to engage in a socket formed in the lower portion of the bowl. In use, the ladle can be supported by means of the standard above a small fire, and a flame may be made within the bowl by means of the wick, the metal having been first inserted. By means of the sliding handle, the ladle can be readily operated without the use of a cloth, and without danger of burning the hands of the operator.

The second invention relates to a planter or distributor. The patent upon the same has been assigned to Messrs. R. A. Ward, N. M. Weaver, and George McDonald of Cuthbert, Georgia. In this structure an ordinary plow beam and shovel are employed, and upon the beam is mounted a hopper. Arranged in the lower portion of the hopper is a worm or screw driven by a suitable ground wheel and operating a stirrer also located within the hopper. A feed spout runs from the end of the screw to a point behind the shovel, and the ground wheel acts as a roller. The planter is very simple and at the same time has proven in itself to be thoroughly efficient and practicable.

Another invention along the same line and assigned to the same gentlemen, is a grain drill, the object of which is to properly feed seed, grain or fertilizer to a number of drill teeth simultaneously. In this last construction a feed box is employed divided by a longitudinal partition into separate compartments. Arranged longitudinally in the lower portion of each compartment is a shaft carrying worm threads that feed the grain or fertilizers to the usual drill teeth. Over the mouths of the conducting tubes are arranged triangular partitions, and between these partitions are placed agitators that are driven by the worm threads of the shafts.

Wilson J. Carroll, Denver, Colo. Cash Register and Combination Lock.—Mr. Carroll has recently obtained two patents. The first is for a cash register of the type wherein the amount of the sale is registered and simultaneously recorded upon a strip of paper enclosed within the register casing. The device is remarkable for its simplicity, and includes a rotary printing wheel so related to the number of keys that the depression of one of the latter will first rotate the wheel to bring the proper number opposite the printing point, and will then depress the wheel into contact with a strip of paper. The paper is automatically fed one step or line space during the retraction of any key previously depressed. The depression of a key also serves to operate a rotary sale indicator, which displays to the customer a number corresponding to the number printed on the recorded strip. By an ingenious strip device the money drawer when pushed in effects the release of the scale indicator and permits it to return to its normal position.

The second patent is for a combination lock. Ordinarily the outer door of a dwelling is provided with two or more locks, one being capable of manipulation from either side of the door, and another, as for instance, the night latch, being incapable of manipulation from the outside of the door, except by the use of a key. Mr. Carroll's lock is designed to displace the ordinary arrangement and is so constructed that it may be set for manipulation from both sides of the door, or from the inner side only. In the latter event a person outside cannot effect the retraction of the bolt unless the combination of the lock is known. The device is quite simple in construction, and includes a casing containing the bolt, a series of tumblers and a bolt-operating disk. A rotary and endwise movable spindle is passed through the lock and pro-

vided with knobs on its opposite ends. In one set position the spindle may be turned from either side of the door to retract the bolt, but in another set position the bolt can only be retracted by a person outside, after the spindle has been manipulated in accordance with a predetermined combination to set the tumblers, and has been drawn endwise to connect the spindle with the bolt. The lock is also equipped with an indicating device by means of which an authorized person is aided in manipulating the lock in accordance with a known combination.

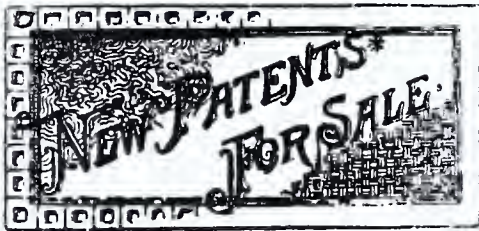
William B. Spencer, Chicago, Ill. Crank Shaft Bearing and Hanger for Bicycles.—The patent discloses a very ingenious crank hanger and bearing by means of which the crank shaft of a bicycle or similar vehicle, may be quickly and conveniently adjusted both laterally and longitudinally for the purpose of taking up the chain slack, and for accurately positioning the pedals with respect to the frame. The crank shaft is afforded a bearing in a hanger sleeve which is adjustably supported eccentrically in a pair of heads retained against the opposite ends of the hanger band. By the longitudinal adjustment of the shaft, the driving and driven sprockets may be accurately aligned, and by rotating the heads, the crank shaft is shifted laterally to take up the slack in the chain and to secure just the right tension on the latter.

James D. Riddle, Chatham, Va. Plow.—The plow of the present invention possesses great merit and is provided with a pair of shovels, which by an ingenious construction may be adjusted to arrange either in advance of the other when turning at the end of the furrow. The shovels are effectively held in either position by a locking device, which prevents them from shifting accidentally. They are shifted automatically by the turning of the plow, and relieve the operator of all manual labor of changing their position. The shovel beams are connected to the ends of a cross head, centrally pivoted and adapted to oscillate to change the position of the shovels. The operating mechanism for controlling the shovels extends to a point adjacent to the plow handles and may be operated without releasing the latter.

William Mansfield, Inventor, Chas. S. Meriwether, assignee, Scranton, Miss. Broom Shield.—This invention relates to a device for enabling broom material to be quickly and effectively applied to broom handles, and when a broom becomes worn, the said material may be readily renewed. The broom material is received within a hollow metallic box-like body, composed of hinged connected sections and provided with means for clamping and engaging the broom material. One of the sections is provided with means for detachably connecting the box-like body to a handle, and the parts may be quickly separated when desired. The device will last a lifetime and any one can operate it.

Henry Barry, San Francisco, Cal. Folding Railway Velocipede.—This patent covers one of the most ingenious devices in railway velocipedes yet produced. This railway velocipede, which is light, strong and durable, is capable of being folded into compact form, in order that it may be conveniently carried upon a railroad train, and it is also adapted to be quickly set up on a track for use in emergencies, for instance, to run back or ahead of a wrecked train to secure aid or to signal approaching trains. It comprises a wheeled platform and a standard foldably connected to the platform and carrying the operating mechanism, which is also of a novel and ingenious character. The great merit of this invention should secure for it quick recognition by railroad companies.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 716,465, dated December 23, 1902. Board-Setting Instrument for Laying Flooring. Grand thing for carpenters. Address, Samuel Nicholls, Sr. Kenesaw, Neb. (jun)

**FOR SALE**—Patented Novelty in Toy Tops now on the market. Dies, tools, etc., some stock. Price \$1,500. Address, S. C. Sanborn, 4743 Calumet Ave., Chicago, Ill. (jun)

**FOR SALE**—Part or outright. Newly invented advertising puzzle. Easily manufactured. Costs less than a quarter of a cent. Contains 100 to 1,000 word ad space. Made of cardboard. Flat mailing. Address, A. W. Mundt, Hammond, Indiana. (jun)

**FOR SALE**—Patent No. 719,011, dated January 27, 1903. Range Finder. Will sell outright or lease with royalty. For full particulars address, Alexander Kennedy, Ponoka, Alberta, N. W. T., Canada. (jun)

**FOR SALE**—Patent No. 710,490. Flexible Partitions at a reasonably low price. This device is second to none. The partitions can be raised or lowered at will with utmost ease. For particulars address, W. F. Miller, Box 26, Kenmore, N. D. (jun)

**FOR SALE**—Patent No. 703,348. Saw Gage and Joiner. Can be used on various sizes of saws without any difficulty. For particulars address, Joseph Hrbacek, Bessemer, Michigan. (my)

**FOR SALE**—A fence wire stretcher. Will sell for cash or trade for real estate. Cut and description on request. Supposed to be worth \$100,000. Address, C. W. Hoagland, Gates, Nebraska. (my)

**FOR SALE**—Patent No. 715,194. Combined Rule and Square. Can use as square or two foot rule. Will mail one upon receipt of seventy-five cents, brass bound, one dollar. P. M. Callahan, Box 248, Denver, Colo. (my)

**FOR SALE**—Patent No. 716,088, dated December 16, 1902. Match Box. Address, Emil G. Nordblom, East Syracuse, N. Y. (my)

**FOR SALE**—Patent No. 697,625, dated April 15, 1902. A device for lifting pipes or rods from wells. May also be used to lower pipes into wells. For particulars address, Anton Hogenon, Calmar, Iowa. (apr)

**FOR SALE**—Patent No. 713,698. Automatic elevator or hoist, designed for elevating or conveying coarse material with wire cable instead of belt. Manufacturers of mining and milling machinery should investigate. Address, J. Sewell, 1100 East 5th Street, Anaconda, Montana. (apr)

**FOR SALE**—Patent No. 688,148. The up-to-date fire place. For neatness, simplicity, durability, and economy. I claim it cannot be surpassed. For sale or lease on royalty. For particulars address, L. B. Arnold, Hanly, Ky. (apr)

**FOR SALE**—Patent 714,527, sale or on royalty. November 25, 1902. Superior merit in fertilizer distributors. No clogging or slipping. Perfectly even distribution without the use of safety-board. Address Ernest C. Smith, Hinckley, Ill. (apr)

Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING Co., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

**"THE INVENTIVE AGE."**

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O. ....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

**FOR SALE OR EXCHANGE FOR LAND**—Patent Farm Gate No. 610,422 Issued Sept., 6, 1898. State rights for sale, or will place on royalty. Prices low. Address, L. C. Tyler, R. D. No. 1, Alexandria, Ohio. (apr)

**FOR SALE**—Patent No. 712,858. An improved adjustable roller curtain bracket. Something new in curtain fixtures. Can be adjusted to hold varying widths of rollers. Can be set to desired place without trouble or worry. Address, Joseph F. Seibert, 1124 Church Street, Reading, Pa. (apr)

**FOR SALE**—Patent No. 528,571. Automatic shutter bowing hinge. Holds shutter in any position desired without use of ribbon. Has other improvements. Will sell county, state or entire right at low rate. Address, Harry Peoples, Box 92, Mount Joy, Pa. (apr)

**FOR SALE**—Patent No. 715,636. Pencil or pen holder made out of one piece of wire. Fastens to top vest pocket. Sells on sight. Address J. R. Booth, Sault Ste. Marie, Ontario, Canada. (apr)

**FOR SALE**—Patent No. 713,242, dated Nov. 11, 1902. Anti-Nicotine. A Great Bonanza. Apply to Rickert & Williams, P. O. Box 257, South Milwaukee, Wis. (apr)

**FOR SALE**—Patent No. 716,510. A new and useful lock designed for mail bags, trunks and chests. Price reasonable. Address, Isaiah Wolf, Midway, W. Va. (apr)

**FOR SALE**—Patent No. 671,498, dated April 9, 1901. Saw Handle Attachment, for blowing sawdust away during operation. Will sell outright or on royalty. Address, Emil A. Michalscheck, No. 1610 Crockett Street, Houston, Texas. (apr)

**FOR SALE**—Patent No. 715,495, dated December 9, 1902. Mail Bag Fastener. For holding the rope of mail bags. Patented in the United States and Canada. Address, Merrill & Son, Nora Springs, Iowa. (apr)

#### WANTED.

**WANTED**—Agents wanted everywhere for the World's Only Egg Separator. Necessary household article, sells on sight. Sample 10 cents. Send for particulars. The Bell & Bacon Mfg. Co. sole owners and manufacturers, Railroad Bldg. Denver Colo. (my)

**WANTED**—Partner wanted with capital to manufacture Nut Wrench patented December 31, 1901, patent No. 690,187. Best wrench for quick work. Address Jesse L. Robison, Cross Fork, Pa. (apr)

## CAPITAL

Can be secured for the right kind of inventions. Perhaps we can help you.

**W. C. & F. D. BURGESS,**  
NEWARK, NEW YORK.

**The Manhattan**  
Typewriter,

Guaranteed to be of the  
Highest Grade.

**NOT IN THE TRUST.**  
**PRICE \$50.**

**JOHN C. PARKER,**  
619 Seventh St. N.W., Washington, D. C.

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. **The ARMY AND NAVY MAGAZINE**, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00



### Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America. For rates, address—

**The Railway and Engineering Review,**  
1305 Manhattan Building, Chicago.

Now is the time to subscribe for

### Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

**SUBSCRIPTION \$2.00 PER YEAR.**

**E. F. OCHS & BRO., Publishers,**

Send for sample copies. ALLENTOWN, PA.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books. Wear like leather.

**FRED. B. NICHOLS & CO.,**

913 E St., N. W.,

Wholesale Stationers. Washington, D. C.

## Magic Rheumatic Cure!

It absolutely does cure. It is not a cheap remedy but it is a **cheap** cure. Mark the distinction! There are a thousand remedies to one cure. This is a CURE. It costs \$2.00 a bottle, and is worth \$20.00 to any sufferer. All good druggists sell it. If not, don't let them "stuff" something else on you. We will send prepaid for \$2.00. Book free. Agents wanted.

**MAGIC CURE CO.**

R. 331-315 Dearborn St. Chicago.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— **The Inventive Age Pub. Co.,**

918 F St., N. W. WASHINGTON, D. C.

**E. C. WILEY,**  
Mechanical = = =

= = = Engineer,

Office 811-1-2 Main Street,

Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.

## RIPANS



The simplest remedy for indigestion, constipation, biliousness and the many ailments arising from a disordered stomach, liver or bowels. Ripans Tablets. They have accomplished wonders, and their timely aid removes the necessity of calling a physician for many little ills that beset mankind. They go straight to the seat of the trouble, relieve the distress, cleanse and cure the affected parts, and give the system a general toning up. The Five Cent packet is enough for an ordinary occasion. The family bottle, 60 cents, contains a supply for a year. All druggists sell them.

## THE AMERICAN HAY, FLOUR, AND FEED JOURNAL.

The Recognized Organ of the Dealers in Hay, Flour and Feed. A Magazine that brings the Miller and Shipper in touch with the Dealer. It shows the Dealer where to buy his Goods.

PUBLISHED MONTHLY.

Subscription price, 50 cents a year in advance. Sample copy sent on application.

**SHIPPERS & RECEIVERS PUBLISHING COMPANY.**  
Produce Exchange. New York City.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, APRIL, 1903.

#### Report of the Commissioner of Patents.

The work at the Patent Office continues to stand at the high water mark, according to the report of the Commissioner of Patents to Congress, under date of January 29, 1903.

In 1902 there were received 48,320 applications for mechanical patents; 1,170 applications for design patents; 151 applications for reissues of patents; 2,602 applications for registration of trade-marks; 1,121 applications for registration of labels; and 266 applications for registration of prints.

During the year the Patent Office issued 27,886 patents, the largest annual issue in its entire history. The receipts over expenditures were \$159,513.54, making a total balance to the credit of the Patent Office in the Treasury of the United States January 1, 1903 of \$5,488,984.61.

In proportion to population, more patents were issued to citizens of the District of Columbia than to those of any of the states or territories—one patent to every 1,080 persons. It must not be supposed from this, that the people of the District of Columbia are more inventive than those of other localities. The reason can be understood when it is explained that parties come to Washington from different sections of the country to obtain patents, and some of them not having a fixed residence, or not caring to disclose their true residence, give the District of Columbia as their place of residence.

The fewest patents granted in proportion to the number of inhabitants were in the Southern states. In this respect, South Carolina leads the list—one patent being issued to every 29,137 persons.

#### Transvaal Patent Law.

The Patent Office Gazette recently contained the full text of the new patent law of the Transvaal, which is now a British colony. A complete copy of the Transvaal patent law can be obtained by sending ten cents to the Commissioner of Patents, Wash-

ington, D. C., requesting a copy of the Gazette. The law is patterned very closely after the English law, and it is believed that it will result in considerable improvement in industrial conditions by stimulating inventive effort. It has been in force since the first of May, 1902.

The State Department is constantly in receipt of letters from the various consuls in South Africa, calling attention to the necessity for the importation of household articles and articles of necessity. Consul-General Bigham writing from Cape Town reported:

"Bricks are among the most expensive articles in this city. I am informed that they are sold for from \$22.50 to \$27.50 per 1,000, and they are so poorly made that they have to be plastered with stucco to keep them from being destroyed by the action of the weather."

Here is a good chance for a manufacturer of brick machines to obtain patent protection on his invention and go to South Africa and make his fortune. In other lines of work, such as agricultural implements and portable buildings, there is a crying demand to be filled. American manufacturers should take note of this promising field and not allow others to control the market.

#### Changes in French Patent Law.

The changes made in the French patent law, which went into effect on the first of January of this year, are very important. It is such a radical departure from the go-as-you-please way in which French patents were obtained in the past, that one has to forget all that he knew of the law and practice of France, in order to be able to ascertain what the present law requires.

Under the old law, the application for the French patent had to be made before there was any publication of the invention elsewhere. By the new law, if the application for the patent in France is filed within twelve months from the filing of the first application in another country, a valid patent may be procured. This is due to the fact that France is a member of the International Union for the protection of patent property.

It was formerly the case that unless the annual taxes were paid on a certain day the patent would cease to run. Grace is now allowed for the payment of taxes, a fine of five francs being imposed for the first month, ten francs for the second and fifteen francs for the third month.

The Patent Office now proposes to issue copies of specifications and drawings of patents, one of which will be sent gratuitously with every patent deed, so that in the future, copies of French patents can be procured, as is the case with English and German patents. Requirements as to drawings are made more strict, and the practice of presenting in France a large number of claims will have to be abandoned. In fact, the French practice will follow very closely that which obtains in the German Patent Office. At most, two claims will be allowed in any patent. Furthermore, no application will be accepted where the drawings contain over ten sheets and the specification embodies over 3,500 words. So long, however, as the papers accord with the rules, there will be no rejections, because the French Patent Office has not yet adopted the search plan, and will not make any examination to determine the validity or novelty of the invention embraced in the application.

#### "Syrup of Figs" Declared Deceptive.

The public are more or less interested in a recent decision of the Supreme Court of the United States. The case is entitled Clinton E. Worden & Company vs. The California Fig Syrup Company. We have all seen the "Syrup of Figs" advertisement staring us in the face from newspapers, billboards, show-windows and house-tops. We are advised that the California Fig Syrup Company have spent in the neighborhood of a million dollars in advertising. Of course it must have been paid them, or they would not have continued it. Naturally they had a great many imitators, and it was not long before legal redress against the infringers was sought by the California Company.

First there was a suit instituted March 6, 1895, in the Circuit Court of the United States for the District of Massachusetts against Kate Gardiner Putnam and others. Circuit Judge Colt dismissed the bill with costs. On appeal to the Circuit Court of Appeals for the First Circuit, the decree of the Circuit Court was affirmed.

In the Circuit Court of the United States for the Eastern District of Michigan, on April 1, 1895, the California Fig Syrup Company sought to restrain the well-known drug firm of Frederick Stearns & Company, Detroit, Michigan, from using the words "Fig Syrup." The court declined to grant an injunction and dismissed the bill with costs. On appeal to the Circuit Court of Appeals for the Sixth Circuit, the decree of the circuit court was affirmed.

On June 1, 1897, the California Fig Syrup Company sued Clinton E. Worden & Company, a corporation of California, and sought to restrain them from the use of the words "Syrup of Figs" or "Fig Syrup." A large amount of evidence was taken, and on June 7, 1899, a decree was entered by the Circuit Court perpetually enjoining the defendant company from making, selling or offering to sell any liquid laxative medicine or preparation under the name of "Syrup of Figs" or "Fig Syrup," or under any name in colorable imitation of the name "Syrup of Figs." An appeal was taken to the Circuit Court of Appeals for the Ninth Circuit, where the decree of the circuit court was affirmed.

The case was then brought to the Supreme Court of the United States by a writ of certiorari. Eminent counsel appeared for both parties. The Hon. John G. Carlisle, Ex-Secretary of the Treasury was retained on behalf of the California Fig Syrup Company. It will be seen from the syllabus, printed in another column of this paper, that the Supreme Court overruled the two lower courts of California and sided with the Massachusetts and the Michigan tribunals, holding that,

"Syrup of Figs" as a trade-mark or trade-name for a medical preparation, containing no appreciable amount of the syrup of figs, is deceptive and not entitled to protection as a property right."

This will undoubtedly end the litigation, for there is no other action that the California Fig Syrup Company can take in behalf of its interests. As a result, anyone is at liberty to manufacture a liquid laxative medicine and call it "Syrup of Figs" if he chooses to do so. We have no idea that the California Company will discontinue using the name. Their advertising has made it too valuable;

besides, the public will continue to buy the liquid under the delusion that it contains an extract of figs. Imitators, however, will take advantage of the situation and enter the field which is now left open. How much better would it have been if the California Company had selected a mark which it could have monopolized, instead of trying to deceive the public by the adoption of a name, which common sense should have taught them they could not restrain others from using, when they were themselves parties to a gross deception of the public.

#### Liquid Air.

It is not so many years ago that Tripler and his liquid air experiments were being exploited in the papers and magazines. Much was written about the value of the invention, and how it would revolutionize everything. The numerous uses to which liquid air could be put were set forth in much detail, and the prospectus of the company organized to exploit the process was most alluring. Considerable stock in the enterprise must have been disposed of, and many honest well-meaning people deprived of their hard-earned money by the purchase of stock in the Tripler concern. Subsequently, it was learned that the merits of liquid air had been over-estimated, and what utility it had was not as great as had been prophesied at the time of the discovery.

The process of liquefying air as practiced by Tripler consisted in compressing the air, cooling it, expanding it through a suitable valve directly into a space maintained at a lower pressure, and causing the expanded cold air to absorb heat to its full capacity from compressed air about to be expanded, whereby the air was progressively cooled until its critical temperature was reached and a portion of it thereafter liquefied.

As is the case with all new inventions, other inventors arose to dispute the claims of Tripler as the inventor of liquid air. A party by the name of Carl Linde claimed that he was the first to invent the process of refrigerating and liquefying air, and the fact that he had priority of application date in his favor made it easy for him to establish his claim. An interference was pending in the Patent Office for several years between Tripler and Linde, and by a recent decision of the Court of Appeals of the District of Columbia, the court of last resort in interference matters, it has been decided that Carl Linde is entitled to the judgment of priority of invention, thus sustaining the tribunals of the Patent Office which decided along the same line. This is the last act in the proceedings to obtain a patent on the invention, and from now on, the public will have to look to Linde and not Tripler, as the party from whom liquid air may be expected to reach a practical result. The determination of the question of priority between these two inventors shows that the person who obtains the most newspaper notoriety about an invention is not always the true inventor. Probably the public have never heard of Linde before in this connection, and have been lead to believe that Tripler was entitled to the credit for the conception and completion of the process for liquefying air. The termination of the interference proceeding, however, shows that Linde was the true inventor. The stockholders in the Tripler enterprise may now divide what is left and close up the business.



## SCIENTIFIC

## PROGRESS.

## Induction Coil.

Mr. Albert L. Parcellle, of Boston, Massachusetts, has obtained a patent on an induction coil, whereby means are provided that are acted upon by a plurality of circuits for effecting electrical impulses in a single circuit. Briefly stated, the invention consists of an induction coil, comprising two independent primary coils and a secondary coil common thereto, whereby the passage of a current of electricity through either of the primary coils will affect the electrical condition of the secondary coil.

## Hollow Carbon Arc Light.

A new form of arc lamp invented by Dr. Bang, of Copenhagen, and described in *La Nature*, has hollow carbons through which runs a current of water. They are thus kept cool, so that one may touch them without getting burned, while ordinary arc-light carbons reach a temperature of 3000°. The energy wasted as heat is thus much less, and the carbons are used up less rapidly. The lamp will probably be largely used in medicine, especially in the phototherapy of Dr. Finsen.

## Making Luminous Photographs.

This is done by means of calcium sulphid, otherwise luminous paint. A sheet of transparent celluloid is coated with an emulsion of nine parts of gelatin, one of potassium bichromate, five of calcium sulphid, and one hundred of water. The gelatin is soaked in the water, and melted in a water bath, the other ingredients being added afterward. When the coated film is thoroughly dry, it may be printed upon from a positive through the celluloid film. This precaution is necessary to prevent the image washing off during development, which is done by hot water, as in the case of a carbon positive. Backed up by black velvet or paper, the print will appear as an ordinary black-and-white positive by daylight, to which it should be freely exposed, and will be self-luminous in the dark.

## Case Hardening Steel.

James P. S. Lawrence of the United States Navy, has patented a device for case hardening steel articles, and has assigned a one-half interest in the patent to Mr. Thomas B. Zell of Reading, Pennsylvania.

The invention is more particularly adapted for case hardening the rims of steel articles, such as wheels, and the object is to provide means for effectively retaining the carbonaceous material. To this end the inventor employs a support or casing for the article which is circular in form, and has an open top and bottom. Upon the interior of this casing is arranged an inwardly and upwardly extending annular flange, forming a channel or pocket. There is also employed a circular cover which can be placed upon the upper edge of the casing so as to cover the pocket. In use, the wheel or article to be treated is sup-

ported within the casing upon the upper edge of the flange, and carbonaceous material is packed within the channel around the peripheral portion of the article. The cover is then placed upon the casing, and the receptacle, with the wheel thus enclosed, is inserted in a furnace where it is subjected to the requisite heat. The central portion of the receptacle being open, permits the heat to reach both sides of the wheel, and the peripheral portion thereof absorbs an additional percentage of carbon, being thus hardened considerably more than the portion not in contact with the carbonaceous material.

## A New Fire-Resisting Substance.

It is generally acknowledged by those who have given attention to the subject that an absolutely fireproof house is a thing impossible of achievement, for although we may employ unflammable materials in its construction, its contents will always present an opportunity for the play of flames. At the same time it must be admitted that our ordinary modes of building construction are open to grave condemnation on account of the unprotected woodwork which forms the foundation of walls, flooring, and stairways. Recent legislation has formulated certain rules which have to be adhered to by builders; but we have not as yet gone very far towards the realization of a fireproof structure. A demonstration was recently given at the factory at Higham Kent, England, of a fireproof material called uralite, which is made by the British Uralite Company. Its principal ingredient is asbestos, which is combined with chalk, water-glass, and other materials. The composition is rolled into sheets and boards, and can be used in place of wood in house construction, for roofings, ceilings, floors, and partitions. It can be planed, sawn, and worked with carpenters' tools generally, like ordinary wood, while at the same time it will stand the action of continued heat with impunity. We are without any information as to the cost of uralite as compared with timber, and cost is unfortunately an item of great importance in the adoption of any new material.

## German Fire Extinguisher.

During the past year, several interesting and instructive experiments were made in Bremen, Germany, with different fire extinguishers. The most successful of these trials took place recently in the presence of several directors of the North German Lloyd and other steamship companies, and many insurance men. The new apparatus, called the "Excelsior," consists of a metal cylinder, containing about 5 quarts of liquid bicarbonate soda, in which is a small auxiliary perforated cylinder incasing a glass tube filled with acid. Its size and weight are such as require but little strength and skill in managing it. Before using, the Excelsior must receive a blow sufficient to break the glass tube, permitting its contents to mix with the bicarbonate of soda, thus forming carbonic acid, which drives out the liquid through the hose or spout attached for such purpose, with tremendous force. This solution is claimed to have a much greater ex-

tinguishing power than water, and, in addition, it lessens the smoke.

Three very successful experiments were made. First, a small wood building, with the walls smeared with tar, was set ablaze, and when the heat had reached an intense point, the fire was put out with the use of two apparatus. Next, a pile of wood, at a glowing heat, was extinguished in three-fourths of a minute. To prove the thorough efficiency of the device in destroying smoke as well as fire, a third experiment was made. A barrel of tar was poured out in the open and set afire. The flames produced a thick, black cloud of smoke. The extinguisher had hardly been put into action, when the flames and the smoke began to grow less, and soon were completely extinguished and smothered without using so much as half the contents of one apparatus.

## X-Ray Tracer.

Friedrich Moritz, a Bavarian, residing in Munich, has patented in this country a device which he terms an X-ray tracer, and has assigned the same to Voltom Electricitäts-Gesellschaft, A. G., a firm in Munich. The invention consists in an apparatus for ascertaining the exact shape, size and location of bodies by means of the Roentgen or X-rays. Although it is known that the exact distance apart of two points, and consequently the size of a body could be measured with the aid of these rays, it has hitherto not been possible to ascertain by pictorial representation the true shape and size of a body and its location as regards other bodies without previous measurement. By means of the present apparatus this object is obtained, in that the exact outline of the body to be determined can be obtained within a few seconds. In order to attain this object, the outline of the shadow of the body in question is drawn upon a projection surface in exactly the same size and shape as the original by the aid of the X-ray of a Roentgen tube arranged perpendicularly to the surface and moving freely in all directions in a plane parallel thereto.

For this purpose the table on which the body to be treated is laid, is provided with a suitable supporting frame carrying a drafting plate or surface, which is adapted to be placed directly over the body. Upon this frame is also mounted a movable table provided with a drafting or position-indicating device coacting with the drafting surface. A Roentgen tube is suspended from the movable table and is located directly beneath the operating table, and the indicating device, being always arranged directly beneath the latter no matter what position the movable table may assume. Therefore, if the rays from the tube pass perpendicularly across the edge of the body, the edge of the shadow on the screen or drafting surface will coincide with the position of the marking point, and by moving the tube so that the marking point will be caused to travel around or along the entire edge of the shadow and moving a pencil with the marking spot, the exact size and shape of the body will be depicted on the screen. If the tube is not perpendicular below the edge of the body, the rays will pass obliquely across the same and consequently the edge of the shadow thrown on the screen will be at one side of the marking point. Now if the marking spot be moved toward the edge of the shadow, it will carry the tube toward the edge of the body and therefore cause the shadow, producing rays to approach the perpendicular. It will thus be seen that the apparatus permits the making of a visible record of the exact size and shape of the body.

## A Revolution in Oil Painting.

"Oh if we might only paint with colors that we held in our hands!" exclaimed the great Titian 400 years ago. The twentieth century has realized his dream and the modern artist can use oil colors in the shape of cylindrical sticks and dispense with the paint brush and the palette.

M. J. F. Raffaelli is the fortunate discoverer of this new process. With his colors, which take the place of both the old oil colors and of ordinary pastels, and which contain exactly the requisite quantity of oil, so that there is no danger of blackening of tone by oxidation, a picture can be painted in a quarter of the time taken by the old system, and the artist can follow his thoughts much more rapidly. The art of oil painting is considerably simplified and the artists' means of expression are augmented.

## Fog Signals at Sea.

Transit by sea is said to be safer than transit by land. Certainly when we consider all the methods employed to insure protection to passengers, one can step aboard an ocean greyhound without apprehension. A large proportion of the disasters at sea are due to fog, and any device which will lessen the danger from this source will be regarded as a boon. A system is undergoing trial on the Gulf of St. Lawrence. It is described as follows: To understand the nature of the new fog-signal, let us suppose that at a certain place there are four powerful fog-horns, spread out fan-wise, so that each points in a different direction. Each has its distinctive speech, so many blasts, long or short, sounding every minute or so. These sirens can be heard, under favorable conditions, at a distance of from 15 to 20 miles. An approaching ship when it comes into the zone of sound will hear all the sirens; but one will be much plainer than the other three, for the vessel will be within its particular arc of sound. In a short time, as the ship moves onward, it will come within the influence of the next siren, and so on. As the captain of the ship possesses the key to each set of signals, he soon notes which is the siren whose sound waves are most distinctly audible; and, as he knows the exact direction in which it points, he can get a very good idea of the position of his ship.

## Train Indicator.

An improved electrical train indicator promises relief both to the perplexed public and to the much-questioned train officials. It takes the form of a huge frame having 3 or 4 vertical compartments. A passenger arriving at the station has merely to glance at one of the upright columns where he can ascertain that the next train starts at a given time from a certain platform and that it is timed to stop at stations which are plainly specified.

Of the ten millions horse power available at the Falls of Niagara, only one hundred thousand has been utilized. The Victoria Falls on the Zambesi, Africa, are twice as high and the water which comes over is twice the volume of that of Niagara.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued March 3, 1903.

### MECHANICAL PATENTS.

- Acid ester of methylene diguaiacol and making same. Benzoin. S. L. Summers  
Addressing machine. L. E. Olson  
Advertising automaton. F. C. Dormont  
Advertising device. F. C. Dormont  
Agricultural implement. D. Lubin  
Air inlet. Self-acting. V. G. Bauer  
Air lock. Safety. W. I. Aims  
Air spray. Compressed. L. Scruggs  
Alkali caffeine methylene disalicylate. S. L. Summers  
Alloys of aluminium. Producing A. Manhardt  
Ammunition. Carrier for small arms fixed. 2 pats. A. Mills  
Anchor. Ship's. H. J. Brooke  
Animal trap. V. Weiler  
Annealing apparatus. J. A. Anderson et al  
Arch. Concrete. G. B. Waite  
Automatic coupling. G. A. Hermanson  
Automobile. F. L. Fay  
Automobile steering mechanism. H. H. Buffum  
Awl. Needle. B. E. Hervey  
Axle. Ball bearing. J. J. Hartney  
Baling press. C. H. Jackson  
Baling press. G. B. Triplett  
Band cutter and self-feeder. J. H. Rains  
Bandage. Suspensory. J. L. Lupfer  
Battery cans, &c. Funnel for filling storage. T. A. Edison  
Bearing in swivel joints for hoist blocks. Ball. F. Hooker  
Bearing. Side. reissue. J. C. Wands  
Bed, mattress, or cushion. J. F. Nuuan  
Beets, &c. Topping machine for. C. Sprekels  
Belt. Conveyor. 3 pats. G. C. Plummer  
Belt pad. Hernial. F. Matuchet  
Bib or faucet. S. S. Williams  
Bicycle attachment. H. R. Blomberg  
Bicycle gearing. M. E. Porter  
Bicycle toe-clip. E. A. Thiem et al  
Bit. W. C. Johnson  
Blackheads. Instrument for removing. A. A. C. Hildebrandt et al  
Blast furnace. C. W. A. Koelbeck  
Boat. C. Drohovich  
Boat. Life. R. Forrest  
Boiler flue cleaner. E. O. Henderson et al  
Boiler plug or cover. W. M. Jackson  
Book copy holder. Note. C. H. Glass  
Book. Entry. G. F. Rockafellow et al  
Books. Device for fastening loose leaf. J. A. Waldo, Jr  
Boot. W. Cassie  
Bottle and stopper. Combined. W. Stender  
Bottle closure and brush. E. Weber et al  
Bottle. Non-refillable. H. Van Wie  
Bottle. Non-refillable. C. F. Hatley  
Bottle rinser. M. W. Norkewitz  
Bottle stopper. Nursing. W. H. Morton  
Bottle washing machine. W. J. Cunningham  
Bottles. Apparatus for simultaneously corking a number of. S. Hyden et al  
Bottling apparatus. J. Beiser  
Bowling pin. B. A. Stevens  
Box making and filling machine. W. H. Butler  
Brace. S. Clawson  
Braiding machine. W. Mundt  
Brake beam. H. C. Buhoup  
Brake shoes. Making. J. Timms et al  
Brick construction. E. D. Scott  
Brick drier. T. M. Wilson  
Bridge. Bascule. A. H. Scherzer et al  
Broom holder. H. P. Lanerd  
Brush for cleaning type. J. F. McPherson  
Brushes. Manufacture of. J. J. Hayden et al  
Buckle. Tongueless. L. P. Normandin  
Building block. L. P. Normandin  
Building construction. J. Roemer  
Cabinet. Kitchen. M. J. Carr  
Calendar. A. F. Hoffman  
Calendar roll. F. C. Smith  
Camera focusing hood. E. N. Lake  
Can. J. Kroehler  
Can filling machine. C. H. Ayars  
Car brake mechanism. J. Shelton  
Car. Center dumping. R. H. Hornbrook  
Car coupling. Lateral. S. L. Trueblood  
Car coupling. Lateral. F. Kohn  
Car door. Grain. J. H. A. Huck  
Car door lock. W. H. Fulton  
Car. Dumping. J. L. Hamel  
Car dust proof journal box. J. Rogers  
Car for shipping musical instruments. Freight  
Car platform vestibule. C. A. Glover  
Car. Railway repair. G. L. Bender  
Car step. G. T. Andrews et al  
Carbonating apparatus. J. C. Murphy  
Carbonator. R. Collings et al  
Cart or wagon Dump. G. Streich  
Case for the reception and display of salable articles. L. W. Faber  
Casein. Producing. A. D. Charles  
Cash register. 2 pats. A. Pfaff  
Cash register. Electrical. J. C. Vahjen  
Cast hollow ware. Coring openings in the walls of. P. J. McGuire  
Casting machine. Pig. J. S. Fielding  
Cattle guard. G. A. Preston  
Centrifugal machine. E. D. Mackintosh  
Chain. Detachable link drive. J. M. Dodge  
Chains. Detachable open link for drive. J. M. Dodge  
Cheese cutter. J. Birch  
Chuck. E. J. Skinner  
Chute. Coal. R. K. Teller  
Cigar display box. D. C. Uffelman  
Cloth shearing machines. Lifting mechanism for the cutting parts of. E. H. Marble  
Clothes peg. R. Hawcridge  
Clutch. Z. R. Tucker  
Clutch. E. W. Miller  
Clutch. Friction. M. C. Harris  
Clutch. Friction. G. L. Scott  
Clutch. Magnetic. 2 pats. E. R. Douglass  
Coal or rock drill. 2 pats. L. K. Koontz  
Cock. Stop. P. R. Fern  
Coherer system. Self decohering. A. Popoff  
Coin receptacle. A. Gross  
Coke ovens. Apparatus for making briquets for circular. J. W. Seaver  
Combustible fluid. Producing C. A. Kuenzel Jr  
Conveyer. Endless. W. L. McCabe  
Cooking utensil. E. V. Santee  
Core bar. W. D. Ross  
Corn husking machine snapping rolls F. Hagen  
Cornice brake machine. H. Schott  
Cotton conveyer. Pneumatic. G. E. Richmond  
Cover. Kettle. G. C. Bulgin  
Cracker box rack. O. G. Anderson  
Cranes. Automatic rail gripping or locking device for electric. S. T. Wellman et al  
Crate. Folding. J. A. Stewart  
Croquet board. Parlor. B. T. White  
Curtain roller bracket. H. Reinmann  
Cushion. F. Buob  
Cylinder lock. J. A. Horne  
Dental clamp. W. A. McCarter  
Detector bar clip. G. Smith  
Die. J. R. Blakeslee  
Disinfectants to water closets. Apparatus for applying. F. W. Norris  
Dispensing can. H. Gould  
Display rack. J. H. James  
Distilling apparatus. reissue. N. H. Hiller  
Doll. W. A. Gay  
Door check. C. A. Wissel  
Door hanger. Sliding. J. F. Millerick  
Dough mixer. J. Koelner  
Dress shield. M. G. Tilney  
Drill press. Portable. O. Gustafsen  
Drilling machine tool actuating attachment. W. H. Zellers  
Electric engine. 2 pats. W. T. Clark  
Electric furnace. P. L. T. Heroult  
Electric switch system. A. L. De Leeuw  
Electromagnetic motor. A. Poly Aguirre  
Elevator safety device. W. N. Martin  
Engine. P. F. McMonegal  
Engine for ringing bells or for other purposes. O. A. Alexander  
Engine power transmitting means. J. C. Blevney  
Engine sparking igniter. Explosive. A. Evensen  
Engine sparking igniter. Explosive. C. E. Duryea  
Engine steering gear. Traction W. F. McBeth  
Engines. System of producing electrical sparks for igniting the charges of explosive. G. W. Euker  
Envelope. F. P. Pidgeon  
Envelope. W. N. Bebout  
Envelope machine. G. H. Haslop  
Envelope. Safety. J. N. Tabler  
Exhibiting works of art. Device for. W. Wood  
Explosive engine. A. Evensen  
Eyeglass. J. F. Volle  
Eyeglass guard. S. A. Bromberg  
Fan for hammocks or cots. Self-acting. G. D. McElwee  
Feed trough. W. L. Hollar  
Filter and press. Combined. L. Bolz  
Filtering material. Machine for washing. C. H. Loew et al  
Fire escape. J. J. Johnston  
Firearm. Magazine. A. Mills  
Fireproof partition. H. Maring  
Fish net. I. E. Palmer  
Fish trap. I. E. Palmer  
Flanging machine. T. F. Rowland et al  
Flash lamp. J. Le May  
Flooring clamp. W. H. Early  
Fluid mixer. Automatic. S. A. Smith  
Fluid pressure brake. M. McComas  
Fluid pressure engine. F. W. Lancheater  
Flush bank feeder and cleaner. C. C. Ewing  
Fowl catching and holding. J. S. Orr  
Fowl catching device. H. C. Priebe  
Freezing the ground and excavating or tunneling. C. P. Perin  
Furnace. 2 pats. C. B. Miller et al  
Furnaces. Device for feeding air and steam to. O. N. Guldlin  
Furniture member fastening device. J. P. Howard  
Galvanic battery. Reversible. T. A. Edison  
Game device. J. L. Holmstrom  
Garment clasp. M. Coffey  
Garment creasing device. N. McDevitt  
Garment. Nether. J. Firsching  
Garment supporter. O. S. Lippincott  
Gas burner. W. B. Carrick  
Gas burner. Safety. J. B. Loughead  
Gas generator. Acetylene. D. N. Long  
Gas generator or lamp. Acetylene J. D. Tejada  
Gas lighting. Burner for incandescent. T. J. F. Ryland  
Gas regulating system. G. R. Siefken  
Gas retort discharging apparatus. W. R. Herring  
Gear planer. J. E. Gleason  
Gearing. Power transmitting. O. Dockstader  
Girth. J. Wright  
Glue. Making. R. Arens  
Golf club. J. Govan  
Governor. Rotary engine. J. F. Craig et al  
Grain drying means. L. W. Liles  
Grain separating screen. C. Closz  
Grinding mill. J. C. Wegerif  
Gun. Trap. D. C. Townsend  
Halogenizing organic fluids. L. Markwald  
Hame and trace connection. A. L. Green  
Hame and trace connector. C. L. Wiedrich  
Hammer. Power. J. Delane  
Harness tightening device. C. Berauek  
Harvester. Grain. W. Maloney et al  
Hat guard. A. K. Wilson et al  
Hay and stock rack. Combined. J. G. Sutton  
Heating plant. Steam. D. F. Morgan  
Hinge. E. A. Moore  
Hinge. W. A. Peay  
Hoist. L. D. Round  
Hoof shears. O. C. Coulom  
Horse blinder. O. Vikoren  
Horse kicking block. G. Lewis  
Horseshoe. S. V. N. Hamilton  
Hose coupling. A. B. Wells  
Hose nozzle. J. Busha  
Hose nozzle. C. R. Robinson  
Hub. Z. T. Kale  
Husking pin. P. A. Waller  
Hydrocarbon burner. G. T. Wadkins  
Hydrocarbon burner. H. L. Sherwood  
Hydrocarbon burner. W. J. Stoermer  
Hydrometer. P. G. Richter  
Ice into cubes or blocks. Machine for sawing. J. S. Duncan  
Indicator. G. C. Bailey  
Insect trap. A. C. Davis  
Insect trap. H. S. Raymond  
Jars, bottles, jelly glasses, &c. Closure for. J. W. Kunkel et al  
Joint making machine. H. C. Schneider  
Kinetscope. W. R. Meikle  
Kneading apparatus. Dough. J. Koelner  
Knife and fork cleaner. T. Davidson, Jr  
Knob and bell. Combined door. W. R. Farrel Jr  
Labeling machine. E. T. McKaig  
Ladle. P. J. McGuire  
Lamp sockets. Cluster of plural R. B. Benjamin  
Lamp socket. Plural. 6 pats. R. B. Benjamin  
Lamps. Means for protecting gas or vapor electric. S. E. Flichtner  
Lamps. Protecting device for gas or vapor electric. M. von Recklinghausen  
Lantern. Signal. F. V. Benson  
Last and hinge. S. Mawhinney  
Latch. R. A. Stearman  
Lathe stock feed mechanism. Turret. Z. B. Coes  
Lathe tool holder. T. B. Tiefenbacher  
Ledger. General. C. A. Schofield  
Level and plumb. Combination. G. V. Green  
Life preserver. I. W. Maccolini  
Lightning arrester. W. J. Chapman  
Lime. Treating. B. E. Eldred  
Liquid mixing apparatus. S. A. Smith  
Liquid supply rolls. Controlling device for. J. White  
Lock. I. Wide  
Loom filling feeder. Automatic. E. & J. V. Cuniff  
Loom jacquard machine. J. E. & W. J. Garlick  
Loom shuttle tension device. J. E. Tichon  
Loom. Thread winding. F. H. Frissell  
Looms. Thread-parting mechanism for weft replenishing. C. & G. Brun et al  
Low joint indicating mechanism. M. Bennett  
Lumber registering attachment W. G. Boswell  
Mandrels for conduit sections. Grappling device for. R. W. Lyle  
Mark and display stand. Universal. H. Frankel  
Mash tun and wort separator. Convertible. M. Henius  
Mattes. Converting. R. Baggeley  
Measure. Computing. F. C. Ream  
Measuring and filling apparatus. A. C. Wright  
Measuring and indicating electricity supply. Apparatus for. C. H. Merz  
Measuring device. Height. J. A. Heatly  
Mechanical movement. C. E. White  
Mechanical movement. G. Geer  
Melting apparatus. Portable. N. S. Jenkins  
Metalizing machine. C. L. Weichelt  
Metal working machine. W. T. Sears  
Mirror bracket. W. S. Douglas  
Miter box. Adjustable. A. Sherman et al  
Moistener. Envelop. A. M. Osmun  
Molder's flask. C. Phelps  
Molding apparatus. P. J. McGuire  
Molding flask. 2 pats. P. J. McGuire  
Molding machine. A. Lotz  
Motion. Means for retarding or stopping. M. S. Okun  
Motor suspension. W. O. Webster  
Motors into gear. Device for throwing. L. Maurer  
Movement cure apparatus. C. Owens  
Music holder. Sheet. F. H. Desler  
Musical instrument motor. Mechanical. J. Courville  
Nasal dish. R. L. Harris  
Nozzle. J. Beau  
Nut lock. G. F. Dobbs  
Nut lock. T. B. Stevenson  
Nut lock. W. R. & G. W. Young  
Oil burner. V. F. Lassoe et al  
Oil burner. Generating. P. S. Spiller  
Oil cake trimmer. J. Dion et al  
Optical apparatus. E. W. Beebe  
Oscillating engine. T. Barrow  
Overshoe fastener. S. W. Wilt  
Package. Merchandise. E. C. Fitch et al  
Packing and packing case for piston rods. Metallic. J. H. Lewis et al  
Packing for piston rods. Metallic. J. H. Lewis et al  
Paper bag holder. L. C. Bunnell  
Paper feeder. Automatic. J. L. Sellar  
Paper. Preparing paraffin or waxed. C. I. Goessmann  
Paper pulp screen. W. R. & H. R. Farnsworth  
Paper roll holder. H. J. Stephenson  
Paper trimming machine. Wall. F. L. Fisher  
Pavements. Forming wearing surfaces for asphalt. D. P. Mullen  
Pen. Fountain. R. A. Hamilton  
Photo plates. Portable daylight developing box for. S. J. Sloan  
Photograph developing, toning, and fixing apparatus. A. Schwarz  
Piano. A. A. Huseby  
Pianoforte. J. H. Butler  
Pictures and viewing or reproducing animated scenes therefrom. Apparatus for taking. H. L. Huet et al  
Pipe and bolt wrench and cutter. Convertible. J. J. Gunther  
Pipe cutting and threading machine. J. B. Dumals  
Pipe or bolt threading machine. F. Muenger  
Pipe wrench. J. J. Rhineland  
Pipe wrench and cutter. C. S. Bonney  
Piston head. A. J. Robertson  
Placket fastener. L. A. Gilpatrick  
Plane. J. Allen  
Planing machine. Floor. A. J. Stephens et al  
Planter. Corn. W. S. Graham  
Planter or fertilizer distributor. T. H. Nance  
Plastic gate or corner post. J. A. Mitchell  
Plate lifter. J. A. Dansereau  
Plow. Ditching. J. Z. Stafford  
Plows, &c. Disk bearing for disk. W. P. Hendon  
Power motor. C. C. Robertson  
Power transmitting device. T. B. Jeffery et al  
Precious stone settings. Fastening for. M. L. J. Girdany  
Pressure regulating, governing, safety apparatus. F. Kruger  
Printing cotton. F. Schaab  
Printing machine. Multicolor. F. H. Mowbray  
Printing press delivery mechanism. W. Scott  
Pulley mold making apparatus. C. M. Day et al  
Pump. W. A. Kerfoot  
Pump. A. Radovanovic  
Pump. Combustion engine. G. A. Gemmer  
Pump for cylinder lubrication. Oil. J. W. McClure  
Pump. Rotary. W. E. Cook  
Pump. Rotary. J. Robinson  
Pump valve. Steam. reissue. J. H. Bullard  
Pumping apparatus. Air. B. B. Bower  
Puzzle. J. B. Olsen  
Radiator air vent controlling apparatus. W. S. Johnson  
Rail joint. E. W. Long  
Rail joint and fastening. T. H. Davies  
Rails. Means for removing sleet, snow, and ice from third. P. Lindemann  
Railway building. Tie dumping and turning mechanism for. C. Couran  
Railway cross tie. reissue. F. W. Dunnell  
Railway cross tie. D. Ford  
Railway motor ventilating system. J. H. Fedeler  
Railway signaling apparatus. H. J. Jefcoate  
Railway tie. Z. C. Robbins  
Railway tie. F. J. Sibley  
Railway track. J. R. McFall  
Railway vehicle coupling apparatus. G. B. Orton  
Razor stop hanger. F. H. Anderson  
Razor strops. Preparing. W. McFarland  
Refining engine. S. R. Wagg  
Refrigerating apparatus. Still for absorption. N. W. Condict  
Refuse. Apparatus for treating and utilizing town. W. P. Wrightson  
Rein holder. B. A. Smith  
Rocker or wheel. Cushioned. J. M. Martin  
Rolling mill. C. L. Huston  
Rotary steam engine. J. F. Craig et al  
Routing table. 2 pats. D. M. Heald  
Ruler and blotter. Combined. H. C. Probst  
Ruling and erasing implement. A. W. Steiger  
Saddle pad. Riding. B. F. Amos  
Sash adjuster and locking device. F. Bower  
Sash fastener. F. X. St. Louis  
Sash lock. O. Wall  
Saw mill. Band. D. C. Prescott et al  
Sawmill carriages. Pressure fluid feed for. G. F. Steedman  
Sawmill set works. D. C. Prescott  
Sawing machine. Wood. T. M. Dunagan, Jr  
Scale. E. Finn  
Scale. Weighing. J. W. Cartwright  
Scale. Weighing and computing. S. A. Brown  
Scow. Dumping. W. Y. Gambee  
Screw driver attachment. G. M. Gamwell  
Screw fastening device. E. Rieger  
Screw stock. E. Mengel  
Sealing attachment. Bag. E. Tyden  
Seed cleaner. F. J. Frame  
Seed or fertilizer drill. T. H. Nance  
Seeding machine. S. H. Jones  
Self closing gate. J. W. Henderson  
Self oiling wheel. E. Ramsay  
Sewed articles. Seam for. J. J. McLoughlin  
Sewing machine attachment for sewing on buttons. C. Schneider  
Sewing machine feeding device. O. S. Harmon  
Sewing machine hemmer. O. S. Harmon  
Shade holder. R. M. Hill  
Shade roller spring mechanism. W. D. Harned  
Shafts of metal. Forming pawl openings through round. A. B. Case  
Sheepener. Lawn mower knife. G. Farnsworth  
Sheet delivery mechanism. R. T. Johnson  
Sheet metal plate cleaning machine. R. D. Buncke  
Shelves, &c. Sheet metal structure for. P. M. Wege  
Shoe polishing machine. J. R. McGarrity  
Shoe uppers. Handling horse for. M. A. Hayward  
Shoe uppers. System of handling and storing. M. A. Hayward  
Sifter for heaters, &c. Coal and ash. C. G. Cadwallader  
Silver plating or gilding process. J. Schiele  
Skate sharpener. A. A. Stepinski  
Skirt edging. G. Koss  
Smoke consuming apparatus for furnaces. J. Alves  
Smoke consuming furnace. J. B. Harris  
Snap. Harness. E. L. Maranville  
Snow excavator for railway, &c. O. B. H. Hanneberg  
Snow removing flanger. J. W. Russell  
Spectacle holder. E. H. Ford  
Spinning machine. G. H. Ellis  
Spinning frame. A. E. Rhoades  
Sprinkler system. Automatic. J. F. Brass  
Station indicator. P. J. Wilson  
Stay bolt. S. H. Dunning  
Steam engine. C. W. A. Taylor  
Steam engine. J. J. Burke  
Steam trap. J. Westley  
Steamer for culinary purposes. M. A. Shauman  
Steering apparatus. F. R. White  
Still. G. F. Ahlers  
Stove. J. Wilson  
Stove. Oil. A. B. Hutchins  
Stove. Heating or cooking. P. S. Spiller  
Stovepipe holder. P. E. Getz  
Stovepipe thimble. R. E. Mann  
Sugar and solutions thereof. Purifying. 2 pats. C. A. Spreckels et al  
Sugar mold. H. Passburg



Surgical instruments. Making india rubber  
Surgical needle.....J. A. Nelson  
Switch.....J. N. Kelman  
Switch actuating mechanism.....J. H. Fitch  
Syringe. Vaginal.....D. McPherson  
Table adjustable angularly and vertically.....O. C. Dorney  
Table or type writer desk.....M. A. Deimel  
Target trap.....W. W. McQueen  
Telephone line testing system.....reissue  
Telephone system.....S. B. Fowler  
Telephone systems. Trouble test for automatic.....F. N. Reeves  
Telephone transmitter.....A. F. Lawson  
Telephone transmitter.....L. Mellett  
Tent, canopy, or awning.....E. Arnett  
Thermometer. Electric.....A. Zeleny  
Tie plates. Making.....J. M. Sellers  
Tiles. Joining metallic roofing.....E. L. Quinn  
Tire fastening device. Vehicle.....F. P. Stone  
Tobacco truck.....A. G. Cox  
Tooth regulator.....E. H. Angle  
Toy.....T. G. Davis  
Toy. Scientific.....W. H. Zimmerman  
Toy. Wheeled.....E. Belenger  
Traction engine.....B. T. Gibbons  
Tractor and coke loader.....E. A. Moore  
Transmission mechanism.....A. E. Osborn  
Transom operating apparatus.....E. Wait  
Trolley.....W. H. Goodyear  
Trolley stand.....W. B. Norton  
Trolley wheel for electric tram cars.....A. Selz  
Trolley wires of electric railways. Wire holder for.....L. von Orth  
Trousers.....L. A. Peak  
Trousers stretching device.....E. J. Sander  
Truck.....J. J. Moule  
Truck.....C. E. Taft  
Truck. Car.....G. B. Maltby  
Trunk lock.....C. Salvio  
Truss pad. Hernial.....P. A. Lorenz  
Twister thread guide.....J. R. O'Neil  
Twyer for cupola furnaces.....S. Watt  
Type writer key cap.....B. C. Fox  
Upholstering machine.....D. W. Hymann et al  
Valve.....J. N. Sanborn  
Valve. Alarm safety.....L. Robinson et al  
Valve. Float controlled.....A. Caron  
Valve for compressed air motors. Reversing.....J. Keller  
Valve gear.....F. Feldhaus  
Valve gear. Engine.....A. D. Baker  
Valve. Reducing.....S. M. Vaucrain  
Valve. Regulating.....C. O. Myers  
Valve truing mechanism.....H. H. E. Nemitz  
Vehicle.....C. W. Hunt  
Vehicle draft attachment.....E. N. Clink  
Vehicle. Motor propelled.....F. W. Lanchester  
Vehicle running gear. Motor.....J. W. Packard et al  
Vehicles. Change gear for motor road.....A. de Dion et al  
Velocipede steering mechanism.....B. F. S. Baden-Powell  
Vending machine.....H. L. Shater et al  
Ventilator.....W. Edwards  
Vessels. Apparatus for extracting stranded.....J. Arbutckle  
Vessels. Grounding preventer for marine.....C. Dornfeld  
Wagon body hoist.....M. Plummer  
Wagon bolster hay rack attachment.....A. Hagemeister  
Wagon. Dumping.....A. C. Lemon  
Waists. Attachment for men's or boys'.....H. Saum  
Washing machine.....J. Gladwin  
Washing machine.....F. H. Wiard  
Washing machine.....J. Vining  
Washing machine.....S. Walter  
Washing machine.....F. Warbritton  
Watch glass tray or drawer.....E. U. Kinsey  
Water closet bowl.....J. J. Donovan  
Water closet flush valve.....M. Hogan  
Water gage.....C. Wehner et al  
Water heater.....W. F. Cushman et al  
Water motor.....B. B. Bowser  
Weaner. Calf.....G. M. Loftiss  
Weed puller.....R. Russell  
Weighing apparatus.....A. L. Buckland  
Wheelbarrow.....C. A. Baker  
Whip-socket. Locking.....F. R. Dever et al  
Whips. Means for uniting parts of.....M. O. Felker  
Wicks. Manufacture of slow-burning.....R. Esche  
Window frame. Adjustable.....E. F. Pangburn  
Window frame. Sheet metal.....C. Harris  
Wire stretcher.....M. Matheson  
Wire stretcher.....J. A. Foster  
Wire stretching machine.....J. B. Wilson  
Wooden corks. Making.....L. Le Franc

## DESIGNS.

Fabric.....G. H. Buckland  
Spoon, fork, or similar article. Handle for a.....G. L. Crowell, Jr

Issued March 10, 1903.

## MECHANICAL PATENTS.

Abdominal supporter.....E. M. Temple  
Account sheet.....W. J. Hughes  
Acid. Making methylene citric.....R. Berendes  
Acid salts and making same. Sulfonic.....L. O. Helmers  
Acid salts of alkaline earthy metals and metals proper and making same. Sulfonic.....L. O. Helmers  
Addressing machine.....J. W. Underhill  
Aerated waters. Apparatus for the automatic production and delivery of.....W. Lee et al  
Air brake.....J. Farrar  
Air brake angle-cocks. Operating device for.....W. B. Riley  
Air ship.....E. P. Johnston  
Alarm system. Electrical.....H. M. Sutton et al  
Asphalt. Apparatus for treating rock.....J. S. Downard et al  
Automobile.....L. B. Gaylor  
Automobile carriage.....W. H. Noyes  
Awning. Metallic.....E. Cornitius  
Axle box.....E. Ottenbacher  
Axle Revolving.....C. Faulkner  
Baling press door closing means.....A. Johnson  
Baptismal font.....H. F. Nehr

Barber chair.....F. H. Wilsdorf  
Basket.....J. I. Lane  
Bath tub.....H. Hoeglauer  
Bed. Folding.....C. P. Brown  
Beet topper and puller.....F. Briggs  
Belt. Conveyer.....H. D. Richards  
Bicycle wheel.....G. G. Ritchie  
Bicycle wheel hub.....G. Ellstrom  
Binder for sheet music, &c.....J. C. Kimsey  
Binder. Temporary.....W. J. Brown  
Bit stock.....I. E. Stump  
Blank ends. Machine for finishing.....J. H. Haskins  
Boiler cover plate.....C. B. Fairweather  
Boiler water gage. Steam.....T. W. Rudd  
Book and binding therefor.....N. Bach  
Book. Deposit credit.....T. D. Taylor  
Book. Manifold sales.....J. F. Laning  
Book. Sample.....H. O. S. Carlson  
Boot or shoe fastening.....R. Snapper  
Boring bit. Extension.....J. C. Beyer  
Bottle.....J. A. Ames  
Bottle. Medicine.....reissue.....C. W. McShane  
Bottle. Siphon.....L. Magidson  
Bottle stopper head.....G. Limbach  
Bottling apparatus. Liquid.....G. F. Sumner  
Bowl holder.....G. Grimm  
Bowling alley.....W. H. Wiggins  
Box lid holder.....C. Jack  
Box or package and material therefor.....J. H. Greenstreet  
Brake beam fulcrum.....F. W. Coolbaugh  
Brake beam reversible fulcrum.....C. H. Williams, Jr  
Brooder.....J. H. Swayze  
Brush. Fountain.....H. Brown  
Buckle slide.....J. P. Hunt  
Buildings, &c. Moving heavy.....H. Sheeler  
Butterin and making same.....A. Bergman  
Button. Link.....E. W. Morehouse  
Button turning machine.....H. A. Berger  
Calculating machine keyboard.....W. T. Treadway  
Candlestick drip cup.....T. M. Mulkerins  
Candy box.....C. A. Adams  
Car brake.....F. X. Berube  
Car brake.....F. Theilengerges  
Car. Convertible.....J. A. Brill et al  
Car coupling.....J. & J. O. Timms  
Car door. Grain.....J. L. Hamel  
Car door opening or closing device. Trolley.....W. H. Cook  
Car. Hopper bottom.....J. M. Hansen  
Car wheel.....H. I. McGuire  
Cars on inclines. Means for handling cable-drawn.....T. A. Edison  
Carburetor. Gas engine.....H. A. Davis  
Carpenter's gage.....G. W. Peyton  
Carpet stretcher.....C. O. Devilbise  
Carpet sweeper.....J. W. Sykes  
Cash register.....F. J. Hull  
Cell cases or egg trays. Machine for making.....W. B. Sheperd  
Centrifugal separator.....R. A. Lucas et al  
Chair attachment.....J. F. Bloch  
Check holder and cutter. Cash.....A. D. Joslin  
Chuck. Drill.....F. P. Gates  
Cigar maker's knife.....O. L. Buehler  
Cigar or cigarette mouthpiece.....J. & L. Przedeci  
Circuit controller.....J. S. Hobson  
Cleaning smooth surfaces. Composition for.....M. Peryer  
Clock key.....O. C. Eggers  
Cloth cutting machine.....R. P. Wright  
Cloth. Ornamenting.....L. & T. David  
Clutch.....F. Claus  
Clutch. Friction.....F. J. Nutting  
Coal drilling machine.....J. W. Shallenberger  
Coat and hat hanger.....G. B. Willett  
Cock. Check and waste.....W. F. Brunt  
Coffee-pot.....T. C. DeHart  
Coin freed mechanism for gas or other fluid meters.....B. R. Beale et al  
Coke drawing machine.....B. J. Matteson  
Collar fastener. Horse.....S. H. Hull  
Comb.....C. Moeschl  
Composition of matter.....F. Padberg  
Condenser. Steam furnace.....2 pats.....J. R. Richmond  
Copy holder.....H. L. Massey  
Corn husking machine.....F. J. Fitzpatrick  
Corn shocker shock forming post.....B. R. Benjamin  
Corn shredding and husking machine.....W. B. Martindale  
Couch head-rest support.....J. Lupino  
Cultivator.....C. L. Swanson  
Cultivator.....J. McCoy  
Cultivator coupling.....R. W. E. Hayes  
Cultivator. Two row disk.....L. Kirlin  
Culvert.....F. S. & F. H. Beach  
Curtain ring.....J. W. Leslie  
Cut-off for cisterns. Automatic.....A. Denning et al  
Cuttlebone mold.....A. A. Geiger et al  
Disinfecting apparatus.....E. Fournier  
Display mechanism. Curtain.....A. M. Davy  
Display rack.....C. E. Brackbill  
Distance meter or range-finder.....J. P. Sorensen  
Dividers.....H. C. Adamson  
Door. Electrically operating.....J. Chambers, Jr  
Double claw or grip device.....H. Sheeler  
Dough cutter or slicer.....E. P. Mossner  
Dough dividing machine.....F. H. Van Houten  
Draft equalizer.....P. Yeager  
Dredging machine.....W. W. Lea  
Dress shield.....D. Basch  
Driving mechanism.....W. Scott  
Driving wheel. Traction motor.....E. Boniecki  
Drop curtain. Mirror.....H. M. Williams  
Duplicating machine.....H. C. Gammeter  
Dye and making same. Yellow sulfur.....C. Ris et al  
Dynamos. Automatic regulator for constant current.....F. B. O'Hanlon  
Egg carrier.....H. S. Jenne  
Electric controller.....F. A. Merrick  
Electric current controller.....J. J. Murphy  
Electric furnace.....A. A. Shade  
Electric motor regulation system.....P. J. Collins  
Electric time switch.....H. C. Froelich  
Electrical contact brush and producing same.....H. N. Moisinger  
Electrode for electrolytic apparatus. Secondary.....P. Imhoff  
Elevator.....W. L. Holman  
Elevator gate operating device.....C. W. Kirsch  
Embankment protector.....E. M. Boynton  
Engine.....F. H. Sleeper  
Engine reversing gear.....J. G. Fairbanks et al  
Evaporating pan.....E. R. Shaw  
Exercising apparatus.....F. D. Smith

Exhaust silencer.....M. Crawford  
Extensible round top table.....E. B. Gregory  
Eyeglasses.....E. L. Lembke  
Fabrics. Manufacturing.....A. Oesterheld  
Fall rope carrier and operating device therefor.....A. Lambert et al  
Fan. Electric.....R. P. Chandler  
Feed for boilers. Automatic water.....C. Wilkins  
Feed water for motor vehicles. Heating.....W. J. & G. Lane  
Fence post.....W. B. Wherry et al  
Fence post.....W. E. Owens  
Fertilizer feeder.....A. L. Miner et al  
Fibrous plants. Machine for defibrating.....W. S. Belding  
Figure. Mechanical.....C. W. Chafee  
Filter.....G. F. Hodgkinson  
Filter.....F. Rothe  
Filter. Barrel.....H. R. Cassel  
Fire escape.....E. Anderson  
Fire escape.....F. D. Wood et al  
Fireproof construction.....G. A. Schilling  
Fluid compression. Apparatus for elastic.....H. Bland  
Fruit box extension frame.....J. Nicholas  
Fruit harvester.....G. H. Shellabarger  
Fulling machine.....L. P. Hemmer  
Game apparatus.....A. J. Musselman  
Game apparatus.....C. A. Fowler  
Game apparatus.....C. N. Morgan  
Garment clasp.....O. Kemper  
Garment clasp or hose supporter.....A. H. Cohn  
Garter.....P. S. Bauer  
Gas burner.....C. F. Glocker  
Gas meter.....2 pats.....H. H. Sprague  
Gas or gasoline engine.....B. Garlius  
Gas regulating valve. Automatic.....C. M. Holley et al  
Gate.....L. Doerr  
Glass blowing machine.....J. Schies  
Glass bodies. Manufacturing hollow O. Schott  
Gold from cyanid solutions. Precipitating.....A. Prister  
Governor.....R. Conrad  
Grain and fertilizer drill.....F. N. Isham  
Graphite separator.....J. H. Davis  
Grazing stake.....J. R. McGoron  
Hair fastener.....W. A. Sloan  
Hammer. Pneumatic.....S. Oldman et al  
Harp.....W. Moerscher  
Harrow.....J. H. Davis  
Harrow and cultivator. Combined.....S. R. Stewart  
Harvester. Corn.....A. S. Gove  
Harvester. Corn.....W. W. Burson  
Harvester. Cotton.....A. Campbell  
Harvester. Pea.....F. W. Rapson  
Hasp.....R. D. Wirt  
Header platform.....R. L. Campbell, Sr et al  
Heating furnace and boiler. Steam.....G. A. Copp  
Heating systems. Means for regulating the temperature in.....W. P. Powers  
Hedge trimmer.....W. Linhoff  
Heel. Boot or shoe.....J. L. Izan  
Hinge. Detachable.....G. B. Pickop  
Hog snout holder.....G. F. Snider  
Hoisting apparatus.....A. E. Norris  
Horseshoe.....T. A. McKay  
Horseshoe. Elastic tread.....H. D. Traveller  
Hydrocarbon burner.....J. G. Branch  
Hydrocarbon motor.....J. W. Packard  
Hypodermic needle.....C. D. Brooke  
Igniting device. Electric.....F. Sturm  
Internal combustion engine.....C. C. Riote et al  
Intestine cleaner.....F. Matheyer  
Iron and steel. Cleansing and improving the quality of.....F. C. Weber  
Iron from its ores. Reducing.....2 pats.....M. Ruthenberg  
Journal bearing.....A. M. Kerr  
Journal bearing.....E. J. Decker  
Journal bearing shell.....M. J. Rogers  
Keg or cask cooler.....S. M. J. House  
Ladder. Step.....A. E. Paskell  
Lamp. Gas.....A. H. Humphrey  
Lamp socket.....reissue.....D. A. Schutt  
Lamp. Vapor burning.....W. Mitchell  
Lamps. Gas detecting attachment for miners' safety.....J. T. Beard et al  
Leather staking machine.....F. F. Slocumb et al  
Letter box.....B. W. Parker  
Letter. Sign.....B. V. Kostka  
Lift. Tradesman's.....C. A. Bouck  
Linotype machine.....L. Cesana  
Linotype machine.....2 pats.....G. A. Bates  
Liquid level indicator.....C. A. Tripp et al  
Lock.....A. D. Plowden  
Lock.....E. Heidman  
Lock.....5 pats.....B. Phelps  
Locks having rocking chambers. Construction of.....L. C. de Preville  
Locomotive cab ventilator.....K. Rushton  
Locomotive engine.....F. J. Cole  
Loom. Power.....S. F. Patterson  
Low water alarm. Steam boiler.....F. O. Stanley  
Lubricating mechanism.....N. A. Christensen  
Malt for mashing. Apparatus for preparing bruised or ground.....V. Lapp  
Match machine.....E. B. Stocking  
Mausoleums, vaults, &c. Roof for.....C. E. Tayntor  
Medical use. Electrical generator and distributor for.....E. L. Madden  
Metal post.....G. Schneider  
Metal sheet drying and fluxing machine.....J. C. Taliaferro  
Milk. Regenerative apparatus for the simultaneous warming and cooling of.....L. P. Larson  
Mold and core drying apparatus.....W. L. Mars  
Motor.....C. H. Roth  
Music record, diagram, or pattern.....R. A. Gally  
Musical instrument mechanical playing attachment.....E. D. Ackerman  
Necktie. Combination S. & S. L. Samter et al  
Nigger bar cushion device.....W. A. McGregor et al  
Nipple. Teething.....F. B. Anderson  
Nut lock.....W. C. Sichel  
Nut lock.....M. Bartley  
Nut burner.....J. McDermott  
Ore handling plant.....G. H. Huelt  
Packing. Metallic.....G. C. Walters  
Packing ring box.....L. H. Martell  
Packing tube.....G. H. Brownell  
Painter's appliance.....L. W. Young  
Paper watermarking device.....J. Barnett  
Peat. Manufacturing plastic objects from.....N. Reif  
Pen filler. Reservoir fountain.....M. T. Horn  
Penholders. Device for mounting.....F. McIntyre  
Pencil sharpening machine.....D. H. Rogan

Phonograph repeating attachment.....D. Petri-Palmedo  
Photographic emulsion and making same.....H. Luttke  
Photographic shutter.....L. J. R. Holst  
Pick.....S. Jones  
Picture apparatus. Animated.....J. A. Pross  
Picture hanger.....A. W. Magerhans  
Picture hanging device.....W. F. Towne  
Picture machine. Moving.....W. P. Warren  
Pie filler. Soft.....J. J. Connors  
Pile.....E. Villet  
Pipes. Floor plate for steam and water.....A. R. Wells  
Piston ring.....W. G. Wilson  
Planter. Combined check row and drill.....A. Anderson  
Planter. Cotton.....I. H. Jackson  
Plow. Wheel.....J. Buchanan et al  
Pneumatic despatch tube apparatus carrier.....C. H. Burton  
Pneumatic lock.....J. Sines  
Pocket book.....3 pats.....H. J. Gaisman  
Pocket. Safety.....B. A. James  
Polishing truck. Tilting table.....L. Gassard  
Power transmitting device.....F. Claus  
Printing.....R. J. Kittredge et al  
Propeller. Screw.....J. A. Fehlman  
Pump lifter.....T. D. Stark  
Pump mechanism.....J. H. Ruch et al  
Pump. Multiple cylinder.....W. H. Millsbaugh  
Pump pressure regulating device.....R. Birkholz  
Pump. Sand.....E. M. Heeter  
Pump suction valve.....reissue.....J. Klein  
Pump. Vacuum.....J. Stumps  
Punch and nail set. Screw center.....N. Bond  
Radiator. Portable.....J. M. Cripe  
Rail clamp. Swinging.....J. F. Busey  
Rail joint.....A. Russell  
Railway. Carriage.....H. L. Stillman  
Railway cross tie.....F. W. Dunnell  
Railway rail joint.....H. C. Wortman  
Railway rail joint.....R. Runolfson et al  
Railway tie.....F. H. Alfred et al  
Railway tie.....W. A. Wetmore  
Railway tie. Metallic.....G. H. Lyle  
Railway train safety appliance.....R. Whittmann  
Range. Gas.....G. A. Simpson  
Ratchet wrench.....A. P. Kershner  
Refuse burner.....D. B. Donnelly  
Revolving press.....J. B. Hough et al  
Riveter or punch. Fluid pressure.....S. S. Caskey  
Roller rack.....J. F. Johnson  
Rolling flanged sections.....T. Morrison  
Rotary engine.....H. Bergmann  
Rotary engine.....W. Buckingham  
Ruler. Dressmaker's.....S. S. Freeman  
Safety pin and hook. Combined.....W. F. Peet  
Sash attachment. Window.....P. Mayotte  
Saw. Wabble.....C. Seymour  
Sawing machine.....J. R. Thomas  
Scaffold. Adjustable.....O. C. Donecker et al  
Scale. Bracket.....G. E. Miller  
Scale frames. Blank for sheet metal.....W. N. Pelouze  
Scraper.....F. T. Powell  
Seal designs. Apparatus for melting sealing wax, &c., on paper or other surfaces for the production of ornamental.....C. H. Williams  
Sewing machine.....G. H. Dimond et al  
Sewing machine creasing means.....G. H. Dimond et al  
Sewing machine loop holder.....H. A. Klumm  
Sewing machine presser foot.....3 pats.....R. G. Woodward  
Shade bracket. Window.....J. A. Scott  
Shear table.....B. P. Swyers  
Shearing or clipping cutters.....T. A. Martin  
Shirt waist holder and skirt supporter.....F. E. Moody  
Shoe stretching device.....J. Karlson  
Snow case corner or fastening.....O. C. Kade  
Smoke stack.....P. Dickinson  
Smoking pipe.....B. Ganim  
Soldier.....H. W. Neild et al  
Sound record.....reissue.....T. H. Macdonald  
Sound records. Making.....reissue.....T. H. Macdonald  
Speed changing and reversing mechanism.....A. C. Sargent  
Speed indicator. Vehicle.....A. L. McMurtry  
Speed transmission mechanism. Variable.....F. J. Nutting  
Spoke. Wheel spring.....A. Prouvost  
Stacker. Pneumatic.....C. N. Leonard  
Stackers. Means for operating the adjustable hoods of pneumatic straw.....J. A. Moser  
Stanchion.....L. H. Andersson  
Stanchion. Cattle.....L. Garrett  
Stand for umbrellas, canes, &c.....H. Werle  
Steam boiler.....P. Ssiway  
Steam engine.....B. J. Carter  
Steam engine.....P. Gindt  
Steam generator.....J. W. Sutton  
Steam generator. Smokeless.....O. D. Orris  
Steam separator.....W. J. Baker  
Steam trap.....J. L. Chapman  
Steam trap.....G. S. Brainerd  
Steel.....C. H. Halcomb  
Steel dies. Manufacture of.....C. Ball et al  
Stocker. Steam.....E. B. Valentine  
Stone. Manufacture of artificial C. W. Stevens  
Stool. Bookkeeper's.....R. W. Jennison  
Storage apparatus.....A. C. Johnston  
Stovepipe polishing machine.....I. Gotthelf  
Stovepipe thimble.....A. Muellerwies  
Stretcher.....J. E. Reeves  
Stud.....A. C. Schlieper et al  
Stuffing box.....B. P. Fielden  
Subway construction.....J. & D. W. Ohaver  
Suit. Combination.....M. E. Cavanaugh  
Surgical instrument.....N. J. Smedley  
Surgical or similar purposes. Electrical instrument for.....M. D. Law  
Synchronism indicator.....J. E. Woodbridge  
Table lock. Pedestal extension.....2 pats.....E. Tyden  
Table locking device. Pedestal extension.....E. Tyden  
Tank discharge means.....L. H. Mitchell  
Tar extract. Obtaining.....M. C. M. Tixier  
Target.....C. L. Finney  
Telephone circuit. Subscriber's.....W. W. Dean  
Telephone support.....J. S. Young  
Telephone system.....J. W. Lattig et al  
Telephone system. Lock out party line.....C. L. Goodrum et al  
Tenoning machine.....E. B. Hayes et al  
Theater scenery. Apparatus for raising or lowering.....E. Lytton  
Thill coupling.....J. Cummings  
Tile curb.....F. Hill



Tile flooring.....C. P. Lawshe  
 Tile or brick, Hollow.....O. C. Pixley  
 Tire bolt wrench.....J. D. Smith  
 Tire, Pneumatic.....2 pats.....J. G. Moomy  
 Tire, Pneumatic.....E. Midgley  
 Tire protecting band, Pneumatic.....J. Wheeldon  
 Tire, Road vehicle.....B. Nadall  
 Tire, Vehicle.....O. Schaefer  
 Tobacco pipe.....H. M. Willis  
 Tobacco pipe.....A. W. Thornton  
 Tools to sockets, Means for connecting.....A. F. Pitkin  
 Trace carrier.....F. L. Beymer  
 Traction device, Electrical.....W. W. O'Malley  
 Train robberies, Device for preventing.....G. A. Copp  
 Tramway, Aerial.....J. N. Bellwald  
 Traveling case.....W. A. Moody  
 Traveling case.....C. S. Morris  
 Tricycle.....W. A. Marqua  
 Trolley, Electric railway.....R. L. McCartney  
 Trolley pole.....H. P. Oler  
 Trolley, Trackless.....A. B. Upham  
 Trolley wagon.....G. H. Hutett  
 Truck and skid, Combined.....J. E. Dilger  
 Truck for transport of ships, &c.....C. V. Suppan et al  
 Truck frame, Railway car.....J. M. Hansen  
 Truck, Portable.....J. E. Dilger  
 Tubes, Manufacturing conical.....E. Bock  
 Turning machine, Wood.....L. D. Bullock  
 Type writer.....A. C. Ferguson  
 Type writing machine.....G. Podlich  
 Type writing machine copy holder.....H. L. Lanphear  
 Umbrella.....C. S. Gurney  
 Umbrella drip cup.....P. J. Flynn  
 Vacuum pan.....J. Lang et al  
 Valve.....F. Palm  
 Valve and igniter, Combined exhaust.....J. Tracy  
 Valve dressing tool.....J. T. Fuhrmann  
 Valve, Reducing.....P. E. Cain  
 Valves for piston or valve movements of any kind, Device for actuating shut off C. Nielsen  
 Vapor burner.....W. Mitchell  
 Vehicle alarm.....J. M. Justen  
 Vehicle body.....H. McLoughlin  
 Vehicle brake, Electric, reissue.....J. N. Mahoney  
 Vehicle draft attachment.....A. P. Speed  
 Vehicle fender or safety device.....C. E. B. Helbig  
 Vehicle, Motor.....R. Stone  
 Vessels' hatchways, Cover for.....E. W. De Rusett  
 Violin sound beam.....J. Bunch  
 Viscometer.....S. Graud  
 Wagon body.....J. H. Anderson  
 Waist and supporter.....S. Vischer  
 Wall.....J. G. F. Lund  
 Washboard.....T. W. Woolley  
 Water closet seat.....C. Sudbrink  
 Weather strip.....L. A. Bartel  
 Windmill starting or stopping mechanism.....T. W. Wheeler  
 Window.....F. Neutwich  
 Window insect guard.....E. P. Doty  
 Window, Revolving metallic.....P. O. Hultmark  
 Window screen.....T. D. Ruth  
 Wood preserving and creosoting apparatus.....L. Hanson  
 Wrench.....J. A. Boyd

## DESIGNS.

Dish or plate or similar article.....A. J. Fondeville  
 Game chip.....S. A. Cohen  
 Metal border.....H. Hillbom

## Issued March 17, 1903.

## MECHANICAL PATENTS.

Account sheet.....R. G. Woodward  
 Acid and making same, Benzyl-naphthylamin sulfonic.....I. Levinstein et al  
 Acid, Making sulfuric.....J. B. F. Herreshoff  
 Addressing machine.....H. L. Gay  
 Aerial apparatus.....J. Kaiser  
 Agricultural machine.....W. Y. Donahoe  
 Air brake.....F. L. Guillemet  
 Air compressor.....B. Gastal  
 Air compressor.....M. W. Marsden  
 Air compressor, Compound.....G. W. Marsh  
 Air ship.....F. A. Summers  
 Anthracene derivatives and making same.....M. Kugel  
 Automatic lubricator.....J. A. Swenson  
 Automobile propelling means.....H. Lemp  
 Axle and journal box, Divided car.....W. P. Wescott, Jr  
 Bait, Artificial.....C. C. Shaffer  
 Baiauce, Spring.....S. R. Munson  
 Banana shipping case.....E. O. Pittenger  
 Bars or shoals, Apparatus for removing.....E. Brace  
 Basket machine.....C. Engberg  
 Basket making machine.....C. Engberg  
 Bath and fever machine.....F. W. Hall  
 Baths, Rose for shower.....W. Kesseling  
 Bed, Sofa.....J. Maher  
 Bedstead and mattress.....G. S. Heatley  
 Bedstead canopy support, Turnback, 2 pats.....I. E. Palmer  
 Bell ringing mechanism, Electromagnetic.....J. J. Sheahan  
 Binder, Temporary.....J. L. C. Montague  
 Bird trap.....F. E. Allen  
 Blacking can.....A. E. Sampson  
 Blocks or ingots, Subdividing.....J. Scales  
 Boat.....E. C. Rosenaw  
 Bookbinder.....G. S. Ring  
 Bookcase, Folding.....D. Scarborough  
 Bottle.....P. J. Richardson  
 Bottle filling machine.....L. Strebel  
 Bottle, Non-refillable.....H. Koorie et al  
 Bottle, Non-refillable.....H. Hafften  
 Bottle, Non-refillable.....F. A. Morley  
 Bottle, Non-refillable.....C. H. Pelton  
 Bottle, &c., stopper.....H. Bouton  
 Bottle stopper.....M. J. Conroy  
 Bottle stopper.....G. F. Harding  
 Bottles, Packing.....A. Mauser  
 Brake.....R. Saltsman  
 Brake applicable to motor cars, other railway vehicles, and revolving shafts generally.....F. Wadey  
 Brake system, Electric.....C. E. Barry

Brick cutting machine.....C. W. Raymond et al  
 Brick edge smoothing blade, reissue.....W. Frey  
 Broiling meat or flesh of animals, &c., Apparatus for.....F. Rademacher  
 Broom handling tumbling barrel.....C. H. Porter  
 Brush.....E. T. Baskin  
 Brush holder.....I. L. Landis  
 Bucket, Garbage.....E. C. Seaman  
 Bucket, Grab.....A. E. Brown  
 Building construction.....J. G. Meyers  
 Button machine, Automatic centering and drilling.....N. G. Baker  
 Cableway system bridle.....F. H. Lamb  
 Calendar.....F. C. W. Steller  
 Calendar support.....F. H. Smith  
 Can header.....L. C. Sharp  
 Can press.....F. Klaus  
 Candy dripping machine.....E. F. W. Wieda  
 Cane, Bleaching.....H. C. Meyer et al  
 Cane, Magazine cap exploding.....J. R. Stanley et al  
 Capsule tubes, Manufacture of.....G. H. Paine  
 Car brake, Railway.....J. J. Kennelly  
 Car, Burglar proof express.....C. Fleischhauer  
 Car coupling.....T. P. Bellows  
 Car door.....P. Brown  
 Car life guard, Tram.....G. Geiger  
 Car, Metallic.....E. W. Summers  
 Car roof.....C. W. Crees  
 Car side bearing.....H. D. Laughlin  
 Card holder or file.....E. W. Woodruff  
 Cash carrier and apparatus therefor.....M. J. Robertson  
 Cement post mold.....L. H. Stoner  
 Centrifugal machine.....J. W. Macfarlane et al  
 Chair.....H. B. Morris  
 Chair book support.....T. Donohue  
 Chimney block.....H. N. Jasper  
 Cigar box.....A. Nederland  
 Cigarette making machine.....A. Fernandez y Fernandez  
 Cigarette making machines, Device for producing continuous strings of tobacco for.....J. Paul  
 Circuit breaker.....R. H. Read  
 Clasp.....A. Roehm  
 Cleaning and scrubbing appliance.....G. Bruhn  
 Clock, Self winding electric.....O. A. En Holm  
 Clothes pin.....D. S. Boyles  
 Clothes rack.....F. F. Witt  
 Clutch.....E. Dysterud  
 Clutch, Friction.....C. R. Greuter  
 Clutch, Friction.....A. Bolzani  
 Clutch, Friction.....C. E. Ellicott et al  
 Cock, Automatic cylinder.....J. N. Mowery  
 Cock, Stop and waste.....S. Resek  
 Cooking oven.....L. J. Hirt  
 Combining needle filling machine.....T. Townsend  
 Compass.....W. Schwarzer  
 Composition.....G. F. Averill  
 Concrete making apparatus.....C. R. Weaver  
 Confection and making same, Malt sugar.....C. H. Burckett  
 Controller.....T. von Zweigbergk  
 Conveyor carriage.....F. H. Lamb  
 Cooker, Steam.....W. R. Flack  
 Copy holder.....C. B. Towers et al  
 Cord or rope making machine.....T. W. Norman  
 Cork or stopper.....W. G. Aikin et al  
 Corn from the ear, Machine for cutting green.....J. C. McIntyre  
 Corn or grain dump elevator.....J. Mabus et al  
 Cotton chopper and cultivator, Combined.....M. A. Beard  
 Counter, Lunch.....F. H. Second  
 Counting mechanism.....F. C. Rinsche  
 Crane, Hoisting.....W. E. Boden  
 Crane, Overhead traveling.....G. Mitchell  
 Cranes and derricks, Chain block for overhead.....A. L. Roberts  
 Cranes, Means for preventing the overwinding of hoist chains of.....G. Mitchell  
 Crate corner strap.....E. F. Gilbert  
 Crate or case.....J. A. Taylor  
 Cross head.....B. J. Reilly  
 Crupper shield.....W. P. Burke  
 Cuff holder.....F. A. Wernig  
 Cultivator.....S. H. & D. Garst  
 Cultivator.....G. L. Wallis  
 Currents, Generating alternating.....C. P. Steinmetz  
 Currents, Rectifying alternating.....E. Thomson  
 Curtain pole.....D. R. Kinsell  
 Cutter head.....F. Stutzman  
 Cutter head, Rotary.....M. W. Mattison  
 Cycle steering head, Motor.....C. F. Thoms  
 Decoy.....H. S. Dills  
 Dental flask press.....T. G. Lewis  
 Dentists' flask.....A. S. Steigerwald  
 Desk clamp.....A. R. Ferguson  
 Door check.....S. N. Shank  
 Door, Grain.....M. C. Rowcliff  
 Door stop and holder.....G. B. Thorpe  
 Dough mixing and raising machine.....G. T. Allen et al  
 Draft equalizer.....M. Whiteside  
 Draft rigging.....A. Lipschutz  
 Draft sill, Pressed metal.....C. S. Shallenberger  
 Drawer, Furniture.....S. Shick  
 Dredge, Hydraulic.....J. Andersen  
 Drill.....C. A. Wessman  
 Drilling machine anchoring device.....I. Wantling  
 Driving apparatus.....J. H. Ingoldsby  
 Driving mechanism.....C. R. Otis et al  
 Dust collector, reissue.....O. M. Morse  
 Dye and making same, Blue polyazo.....I. Levinstein et al  
 Dye and making same, Blue sulfur.....R. Herz  
 Dye and making same, Green anthracene.....O. Bally  
 Dye and making same, Wool.....2 pats.....M. Kahn  
 Earthenware, Manufacture of.....E. G. Acheson  
 Educational apparatus.....L. S. Pratt  
 Electric control of devices at a distance, Apparatus for.....D. M. Moore  
 Electric machine frame, Dynamo.....R. Pfeifer  
 Electric socket and receptacle attachment.....A. F. Hauss  
 Electrical testing apparatus.....H. A. Lewis  
 Electrode frame, Battery.....H. Cottrell  
 Electrode, Reversible galvanic battery.....H. Cottrell  
 Elevator electrical appliance.....J. H. Roberts  
 Elevator safety clutch.....F. D. Potter  
 Elevator safety device, 2 pats.....A. H. Meech  
 Elevator safety device.....F. D. Potter  
 Elevator shaft floor covering and the lifting and disposition of same.....W. G. Kett et al  
 Engine controlling apparatus.....R. J. Sheehy

Engine cylinder, Explosive.....L. M. Johnston  
 Engine cylinders, Apparatus for cooling gasoline.....D. C. Stover  
 Engine guide support, Locomotive.....J. Player  
 Engines, Cooling tank for internal combustion.....C. O. White  
 Envelop.....J. Van Beers  
 Envelop, File.....W. F. Crafts  
 Evaporator, Fruit, vegetable, or cereal.....E. R. Goings  
 Explosion motor, Double acting four cycle.....A. Thiery  
 Explosive engine.....F. W. Toedt  
 Extension table.....C. J. Cook  
 Fabric smoothing and apparatus.....G. B. Bennis  
 Fabrics, Giving lisle thread finish to vegetable.....A. N. Dubois  
 Fastening device.....A. E. Smylie  
 Fastening inserting machine.....G. A. Ambler  
 Fats, Purifying.....C. Fresenius  
 Faucet, Measuring.....W. Goebel  
 Faucet, Washbasin.....A. L. Grotewohl  
 Feed attachment, Boiler.....W. W. Green  
 Feed water regulator.....N. E. Hannemann  
 Feed water regulator.....J. M. Williams  
 Feed water strainer and catch basin.....W. G. Wilmington  
 Feeder, Lamb or calf.....J. H. Cramer  
 Feeding water to steam boilers.....S. M. Guss  
 Fence stretcher, Wire.....I. M. Warner  
 Filing system, Expansive.....D. E. Hunter  
 Films on plate glass or other transparent bodies, Production of.....J. E. Reynolds et al  
 Filter.....L. V. Rood  
 Filter, Coffee or tea pot.....P. A. Webb et al  
 Fire escape.....J. S. Johnson  
 Fire escape.....D. Brown  
 Firearm sight.....J. G. Hubbard  
 Fish hook.....J. A. Smith  
 Floor cleaning apparatus.....G. Swenson  
 Flue cutter.....E. E. Resor  
 Flue dust, Reclaiming.....E. H. Williams  
 Flue dust, Silicated.....E. H. Williams  
 Flushing device.....A. Roekel  
 Fly net holder.....H. C. Peters  
 Fly trap.....S. Rickersberg  
 Folding, wrapping, and pasting machine.....C. Owens  
 Form, Garment.....A. Hoffmann  
 Fruit jar.....E. A. Parker  
 Fruits, Machine for pricking prunes or like.....J. H. Hammer  
 Fuel briquets, Machine for making artificial.....G. M. Fenn  
 Furnace.....W. H. Fenner  
 Furnace.....J. Armstrong  
 Furnace charging apparatus.....C. H. Wellman  
 Furnace door, Air feeding.....C. H. Eddins et al  
 Fuse plug.....S. Rothschild  
 Galvanic battery.....M. M. Bair  
 Game.....W. H. Snyder  
 Game apparatus.....W. R. Williams  
 Game carrier.....M. C. Peters  
 Garbage receptacle container.....C. H. Stephenson  
 Garment hanger.....A. L. Ross  
 Garment supporter.....W. C. Nye  
 Gas cooler.....E. A. Moore  
 Gas engine.....L. F. Burger  
 Gas engine.....G. Westinghouse et al  
 Gas generator, Acetylene.....W. Webb  
 Gas generator, Acetylene.....J. Condon  
 Gas holder.....J. H. Green  
 Gas producer.....F. W. Matthiessen  
 Gas regulator.....C. L. Nelson  
 Gases, Apparatus for treating liquids with.....P. Naef  
 Gearing, Alternating rotary.....J. E. Hausfeld  
 Gem setting.....G. W. Dover  
 Gill drawing frame.....W. Holdsworth  
 Gin cotton cleaner attachment.....M. Ruth  
 Glass carrier for leers, Sheet.....R. L. Frink et al  
 Glass flattening table, Sheet.....R. L. Frink et al  
 Glass furnaces, Device for feeding ash into.....W. B. Cogswell  
 Glass grinding or polishing machine.....D. J. Murnane  
 Glass making machine, Sheet.....R. L. Frink et al  
 Glass, Ornamenting.....J. M. Conroy  
 Glass plates or supports, Manufacture of strengthened.....E. Offenbacher  
 Golf stick.....M. R. Swift  
 Governor, Steam engine.....P. Richmond  
 Grain elevator.....J. F. White  
 Grain separator elevator.....G. F. Conner  
 Grain shaker.....E. F. Nonath  
 Grease cup.....G. Reimers  
 Grinding machine.....J. Benge  
 Grinding machine, Disk.....A. T. Shipp  
 Gumming machine.....H. D. Sisson  
 Gums, Devulcanizing.....P. H. J. Chautard et al  
 Gun recoil brake.....O. Lauber  
 Gun sight telescope.....G. N. Saegmuller  
 Gun sighting attachment.....G. A. Schoeller  
 Gun with barrel recoil having recuperator spring.....O. Lauber  
 Hair comb.....J. Kahn  
 Harvester attachment.....G. F. Vollborn  
 Hat and coat hanger.....H. A. Krezdorn  
 Hat hook.....H. R. Bernard  
 Hay rack.....E. Troy  
 Hay rake, Side delivery.....H. A. Adams  
 Head rest, Adjustable.....C. F. Deardurff  
 Head rest bar.....W. J. Koehn  
 Heating apparatus, Electrical.....J. S. Peck et al  
 Heel building machine.....F. E. Morris et al  
 Hides or skins, Machine for treating.....F. J. Perkins  
 Hinge, Spring.....T. Roche  
 Hog nose cutter.....C. F. Roux  
 Horse bit.....D. W. Donnelly  
 Horseshoe, Adjustable clamp.....D. W. Barr  
 Hotbeds, forcing frames, &c., Light or glazed frame for.....G. Knochenhauer  
 Hydrocarbon burner.....A. D. McLean et al  
 Hydrocarbon burner initial heating device.....W. R. Jeavons  
 Hydrocarbon burner lighting device.....W. R. Jeavons  
 Ice cutting machine.....W. H. De Baun  
 Ice spud and shovel, Combination.....W. J. Ester  
 Ignition device, Electric.....N. Schmitt et al  
 Indigo, Reducing.....K. Muller et al  
 Induction coil.....A. L. Parcell  
 Inhaler.....C. W. Taylor  
 Insulator, Third rail.....S. B. Stewart, Jr  
 Iron bars or tubes, Machine for cutting.....W. Hopfinger  
 Iron sawing machine, Cold.....J. E. Carter et al  
 Ironing board.....W. Savidge  
 Ironing machine.....E. J. Lane  
 Jail or prison.....2 pats.....F. O. Weary

Jar closure.....J. W. Davis  
 Journal boxes, Lid construction for railway.....T. H. Symington  
 Journal cooler.....J. W. Marthis  
 Journal cooling and lubricating means.....P. Naef  
 Key ring.....S. Mountford  
 Knitting machine.....B. Salzer et al  
 Knobs, &c., Means for securing door.....E. Pearson  
 Label holder.....L. Weigel  
 Lace and cord fastener.....A. H. Smith  
 Lacing tip.....F. Richardson  
 Ladder.....L. O. Lorenz et al  
 Ladder attachment.....L. O. Lorenz et al  
 Lamp glowers, Making electric.....M. W. Hanks  
 Lamp glowers, Sorting device for electric.....A. J. Wurts  
 Lamp glowers, Treating electric.....M. W. Hanks  
 Lamp, Incandescent mantle.....E. A. Schoettel  
 Lamp shade holder, Electric table.....R. Walker  
 Lamp, Signal.....F. W. Dressel  
 Lantern, Signal.....R. Black  
 Lantern, Signal.....F. W. Dressel  
 Lathe, Copying.....C. Seymour  
 Laundry bag.....E. Bourne, Jr  
 Lemon squeezer.....M. Redlinger, Jr  
 Lifting jack and stump puller, Combined.....C. G. Hoffmann  
 Linotype machine.....J. S. Thompson  
 Liquids, &c., Apparatus for controlling the delivery of viscous.....C. F. Mendham  
 Locking attachment.....S. Storm  
 Locomotive and car for use on single-rail elevated railways.....E. S. G. Rees  
 Loom jacquard mechanism.....H. Hardwick  
 Loom warp stop motion.....J. T. Cyr  
 Looms, Thin place detecto mechanism for.....E. E. Shelters et al  
 Mail box carrier.....I. Unger  
 Mallet, Automatic.....A. W. Browne  
 Malt turning machine.....D. D. Weschler  
 Mandrel for conduit sections.....R. W. Lytle  
 Manometric gage.....C. Schmitz  
 Massage apparatus, Electrical.....W. F. Hedstrom  
 Mechanical movement.....J. R. Carter  
 Mine haul, Single cable.....C. W. Damron  
 Mitten.....W. S. Lodge  
 Molder's flask and gate.....S. Griffith  
 Motor.....C. B. Cox  
 Mouse trap.....W. C. Hooker  
 Mower attachment.....G. F. Butch  
 Mower bunching attachment.....J. W. Latimer  
 Muffler, Exhaust.....A. Winton  
 Music recording apparatus.....L. O. Rissman  
 Nail or tack heading apparatus.....A. H. Brigham  
 Nickel ores, &c., Treating, 2 pats.....T. Jenkins  
 Notice board or the like.....F. T. Vine  
 Nut lock.....L. V. Rathmell  
 Nut lock.....W. U. Rosenthal  
 Oil burner.....H. Luckenbach  
 Oiling cup for lubricators, Auxiliary hand.....F. W. Edwards  
 Ore concentrator.....J. B. Arthur  
 Ores, Treating.....F. R. Carpenter  
 Ores, Treating.....P. A. Knappe  
 Packing apparatus, Automatic.....G. W. Hannan et al  
 Packing machine.....J. C. Thom  
 Packing, Piston rod.....E. W. Tucker  
 Padlock.....F. Soley  
 Paint can and paint mixer, Combined.....J. E. Furlong  
 Painted surfaces, Composition for cleansing.....E. J. Watkins et al  
 Pamphlet coverer.....C. Owens  
 Paper bag machine.....C. S. Jackson  
 Paper pulp.....J. C. Coleman et al  
 Paper pulp screen.....S. H. Tibbetts  
 Paper roll bushing or plug.....C. E. Thurman  
 Paper roll holder.....C. E. Turner  
 Parcels, &c., Device for carrying.....F. Doughty  
 Pasteurizer, cream, ripener, churn, and butter-worke, Combined.....D. W. Payne  
 Pea sheller, Green.....B. E. Preston  
 Pen, Fountain, 2 pats.....P. E. Wirt  
 Pen holder.....J. R. Grymes  
 Pencil sharpener.....J. H. Fassett et al  
 Petticoat.....H. L. Klein  
 Photographic developing apparatus.....F. L. Coudit  
 Photographic film.....W. H. Smalley  
 Piano automatic attachment.....J. A. Smith  
 Piano keyboard attachment.....G. G. Mahr  
 Piano, Upright.....A. G. Gardner  
 Picture post card, &c.....A. Jasse  
 Pipe core machine.....F. Britz  
 Pipe coupling for deep boring devices.....T. Steen  
 Pipe drive head.....P. H. Mack  
 Pipe molding apparatus.....O. Bergstrom  
 Piston.....R. Morrill  
 Planter, Check row corn.....J. P. Fox  
 Planter, Corn.....E. M. Heylman  
 Planter, Seed.....L. L. Bevis  
 Planter, Wireless check row corn.....W. W. Watson  
 Plaster, Wall.....W. H. Orr  
 Pneumatic transmission system.....B. C. Batcheller  
 Pole or post.....C. B. Voynow  
 Post.....W. A. Noble  
 Powder dispensing device.....G. L. Wernet  
 Precious metals from solvent solutions, Separating.....J. P. Schuch, Jr  
 Pressure regulator.....J. E. Spencer  
 Pressure regulator.....B. Zindel  
 Printer's quoin.....H. A. White  
 Printing and addressing circulars, &c., Machine for.....J. O. Clement  
 Printing press stop motion.....G. R. Williams  
 Printing press stop motion.....G. R. Williams  
 Printing surfaces, Producing.....O. Forster  
 Propeller.....T. Edgington  
 Pulley, Belt.....2 pats.....P. Medart  
 Pulverulent, granular, or like substances, Apparatus for discharging.....A. Weiss et al  
 Pump.....L. J. Phelps  
 Pump, Feed.....A. B. Moore  
 Pump rods, Gripping attachment for oil well.....J. W. Rhoades  
 Punch and shearing machine, Combined.....O. Knudson  
 Puzzle.....C. A. Bennett  
 Puzzle.....J. L. Adams  
 Pyrometer.....F. W. Taylor et al  
 Rail brace and tie plate, Combined.....D. Ryan  
 Rail joint.....A. H. Ambler  
 Rail joint.....A. L. Rosemond  
 Rail shoes, Circuit breaker for third.....M. M. Wood



Railway coach.....C. Ansoerge  
 Railway crossing gate mechanism. Automatic  
 Relay.....J. N. Hyke  
 Railway current collecting device. Electric.....  
 C. A. Terry  
 Railway frog foot guard.....C. Holtmann et al  
 Railway rail bond. Electric.....T. Kerr  
 Railway rail coupling. Electric.....T. Kerr  
 Railway rail joint.....H. Glover  
 Railway structure. Elevated.....G. H. Thomson  
 Ratchet wrench.....C. B. Gracey  
 Rectifier.....E. Thomson  
 Refractory material.....E. G. Acheson  
 Relay.....W. W. Dean  
 Rivets. Device for electrically heating.....  
 H. V. Loss  
 Rivets. Heating.....H. V. Loss  
 Rock drill.....V. Schneider  
 Rolling mill friction driving mechanism.....  
 C. A. Erbsloh  
 Rope clamp.....F. C. Crowe  
 Rotary engine.....H. Igel  
 Rotary engine.....T. Oliver  
 Roundabout sailing apparatus.....A. Kitterman  
 Rubber boots or shoes. Foxing for.....  
 H. J. Doughty  
 Rubber shoes. Mechanism for manufacturing.....  
 H. J. Doughty  
 Ruling parallel lines. Apparatus for.....  
 W. Schmitt  
 Sand. Treating molding.....W. J. Patterson  
 Sanding device.....J. J. Kennelly  
 Sash fastener.....H. R. Fay  
 Sash lock and lift.....J. E. Riley  
 Sash. Window.....J. E. Beazley  
 Scale. Railway.....M. E. Reisert  
 Scissors, &c. Sheath for.....H. C. Willmott  
 Scoop.....G. Flitsch et al  
 Screw. Binding.....I. S. Turner  
 Sewing machine bobbin latch.....W. A. Mack  
 Sewing machine tucking guide.....  
 W. M. Ammerman  
 Shade adjuster. Window.....C. A. Scheif  
 Shaft support. Vehicle.....W. H. Burcher  
 Shafting sleeve. Flexible.....A. W. Browne  
 Sharpener.....H. Bucking et al  
 Shirt neckband.....D. B. Coon  
 Shoe polishing machine.....E. Dagger  
 Shoe regloring device.....N. S. Wakefield  
 Shoestring fastener.....A. P. Pitman  
 Showcase for confections.....K. Panay  
 Shutter worker.....H. Osborne  
 Sidestick and quoin. Combined.....  
 W. S. Rhodes et al  
 Sifting machine. Sand J. W. Sappington et al  
 Signaling.....N. Tesla  
 Silicon, oxygen, and carbon. Producing com-  
 pounds containing.....E. G. Acheson  
 Single trigger mechanism.....J. J. Hewson  
 Skirt. Adjustable.....B. Stillson  
 Skirt supporter and skirt waist holder.....  
 F. J. Smith  
 Skirt. Woman's.....A. Adler  
 Slate or similar device for educational pur-  
 poses.....H. King  
 Smelting furnace. Crucible O. Forsbach et al  
 Smoke consumer.....J. & W. Wildman  
 Smoke consuming means.....G. Boulet  
 Soap cutter and spreader. reissue J. J. Gaynor  
 Sole leveling machine.....B. Phillips  
 Solutions. Concentrating.....A. Gurbur  
 Sound recording and reproducing machine.....  
 G. H. Hall  
 Sound reproducer.....W. Tures  
 Spinning machine roll cleaning device.....  
 V. Mahieu  
 Spinning mule.....H. S. Golland et al  
 Sprinkler head.....C. W. Kersteter  
 Stacker. Pneumatic.....C. N. Leonard  
 Stair. Counterbalancing.....P. L. Larson  
 Stamp. Hand.....B. B. Hill  
 Staple puller.....G. P. Haley  
 Station indicator.....C. D. Osborn  
 Steam generator.....A. S. Kiefer  
 Steam or other fluid pressure motor.....  
 F. Lamplough  
 Steel articles. Device for case hardening.....  
 J. P. S. Lawrance  
 Stereoscope.....D. E. Kirkpatrick et al  
 Stirrup.....H. Nikolaisen  
 Stone. Decorating.....E. E. Hippe  
 Store service apparatus.....A. L. W. Begg  
 Street indicator and advertiser. Automatic.....  
 T. A. Reader  
 Sunshade attachment. Vehicle G. S. Bozarth  
 Surfaces. Protecting.....W. H. Grow  
 Suspenders.....C. L. Buschmann  
 Suspenders.....H. C. Hine  
 Switch operating device.....A. Hepola  
 Syringe.....W. M. Decker  
 Syringe case. Hypodermic.....T. A. Chappell  
 Syringe rectal nozzle.....W. M. Decker  
 Syringe vaginal nozzle.....W. M. Decker  
 Table and desk. Combined.....F. H. Dukessmith  
 Tanning.....M. C. Lamb  
 Telegraph. Electric.....I. Kitsee  
 Telegraph pole socket.....C. H. Baker  
 Telegraph system. Alarm.....A. Goldstein  
 Textile material non-inflammable. Rendering.....  
 W. Warr  
 Theatrical appliance.....D. J. Canary  
 Thresher.....J. J. Skinner  
 Threshing machine.....H. L. Hunt  
 Threshing machine grain separator.....  
 I. M. Cooper  
 Tile. Roofing.....H. B. Skeele  
 Tiles, &c. Press for the manufacture of stove  
 tiles.....G. Bahr  
 Time recording device.....J. K. Barber  
 Tin from the surface of other metals. Removing.....  
 A. K. Eaton  
 Tire and cranberry scoop.....W. T. Makepeace  
 Tire. Composite wheel.....E. I. Braddock  
 Tire set.....J. B. Kimbrell  
 Tires. Manufacturing pneumatic U. P. Smith  
 Titanous chlorid. Manufacture of.....H. Spence  
 Tool handle.....C. V. B. Reeder  
 Tooth. Artificial.....T. H. Whiteside  
 Tooth powder box.....W. H. Hall  
 Tower.....G. G. Guy  
 Toy.....H. S. MacKaye  
 Toy.....H. K. Reed  
 Track gage. Automatic inspection.....  
 H. B. Merriam  
 Traction wheel.....G. P. Breed et al  
 Trap.....J. P. White  
 Tread power.....W. De Graw  
 Trimming.....H. T. Loomis  
 Trolley.....S. H. Limbert  
 Truck.....G. W. Davis  
 Tube cleaner.....C. A. Pratt

Tug. Shaft.....Z. Wiggs  
 Tumbler washer.....E. E. Murphy  
 Twine.....G. H. Ellis  
 Twisting machine.....G. B. & E. Dennis  
 Type writer carriage shifter.....J. S. Parmenter  
 Valve. Automatic oil feed and check.....  
 B. Ivor et al  
 Valve. Balanced.....S. Martin  
 Valve. Collapsible piston.....W. G. Sinnamon  
 Valve extractor.....C. Goodrich  
 Valve for hydraulic rams. Compensating.....  
 P. B. Clarke  
 Valve for syringes, atomizers, &c S. Schwerin  
 Valve. Gas engine.....L. F. Burger  
 Valve. Operating.....C. L. Moore  
 Valve. Steam engine.....H. W. Germiner  
 Valves or explosive engines. Mechanism for  
 automatically operating exhaust J. E. Jones  
 Vault trap.....N. A. Stephens  
 Vehicle guiding apparatus.....A. J. Thomure  
 Vehicle. Motor.....G. J. Scott  
 Vehicle. Pleasure.....L. A. Thompson  
 Vehicle steering gear. Motor.....F. Lamplough  
 Vehicle steering mechanism. Motor.....  
 R. Watson  
 Vehicles. Foldable hood for wheeled J. Mutch  
 Vise. Machine.....J. W. Crippen et al  
 Wagon body and hay rack. Combined.....  
 H. S. Cunningham  
 Wagon. Dumping.....C. Pullar  
 Watch. Stem winding.....A. Aune  
 Water closet seat protector.....J. A. G. Power  
 Water heater.....A. Haug et al  
 Weather strip. Door.....L. E. Rolph  
 Weed destroyer.....J. Bondurant  
 Well cup. Oil.....M. Wert  
 Wheel attaching device.....W. Runge  
 Whisking, mixing, or similar machine.....  
 W. K. & G. S. Baker  
 Windmill.....J. P. Flaig  
 Window.....W. Schaar  
 Window. Metallic revolving.....L. Christenson  
 Windows. Transparent panel for glazed.....  
 F. A. Jumeau  
 Wood plates. Making.....F. A. Manuel  
 Wood scraper.....L. F. Deffaulx  
 Wrench.....M. Barber  
 Wrench.....E. C. Smith

## DESIGNS.

Bracket.....M. G. Priore  
 Brushes or similar articles. Back for.....  
 S. O. Bigney  
 Tile covering for floors or other surfaces.....  
 J. K. Sierer

Issued March 24, 1903.

## MECHANICAL PATENTS.

Accumulator plate connector.....G. A. Washburn  
 Aerating or carbonating apparatus. Liquid...  
 F. J. Fletcher  
 Air brake system. Duplex.....W. H. Nightingale  
 Air ship.....J. Berry  
 Alloys. Manufacture of cast iron G. Grunauer  
 Amusement way. Centrifugal.....C. L. Hagen  
 Animal trap.....V. O. Harter et al  
 Annealing system.....J. Hughes  
 Army equipment.....R. M. G. Phillips  
 Awning fixture.....J. F. Kohler  
 Back pedaling brake and coaster.....R. A. Bell  
 Bag.....J. J. Jensen et al  
 Baling apparatus. Cotton.....F. L. Dyer  
 Baling press.....T. Collier  
 Bark extracts. Apparatus for mixing.....  
 F. C. Prindle  
 Bathing machine.....H. Thompson  
 Batteries. Armored element for electric.....  
 E. A. Sperry  
 Battery envelope. Manufacture of storage....  
 E. A. Sperry  
 Bed.....C. Taorman  
 Bedstead rail joint. Metallic.....C. J. Witzel  
 Bedstead side rail joint. Metallic.....  
 C. J. Witzel et al  
 Beehive.....J. F. Thompson  
 Belt.....P. F. Haviland  
 Belting.....L. H. Gilmer  
 Bias cutter.....T. B. Reardon  
 Bicycle.....W. Robinson  
 Bicycle.....C. E. Pierce  
 Bidet.....F. A. Wells  
 Billiard tip. Cushion.....J. E. Layley  
 Binder tension device.....R. L. Kortright  
 Blind. Venetian.....A. F. Tumler  
 Boat lowering apparatus.....E. O. Spetmann  
 Rodkin.....G. E. Wheelhouse  
 Boiler furnace. Steam.....J. F. Mock  
 Boilers. Apparatus for indicating the water  
 level in.....P. A. Renaux  
 Book racks. Sheet metal structure for.....  
 P. M. Wege  
 Book stitching machine.....F. Kugler  
 Boot or shoe form.....C. A. Batchelder  
 Bottle closure.....E. W. Kemper  
 Bottle. Non refillable.....J. A. Lahn  
 Bottle rinsing apparatus.....D. Wickham  
 Botte, &c., stopper.....D. C. Demarest  
 Bottle stopper.....H. Gramlich  
 Bottle stopper.....W. H. Sherman  
 Bottle stopping device.....R. Gross  
 Bracket.....C. F. Kade  
 Brake beams. Manufacture of substance for  
 filling hollow.....F. Schubert  
 Brake shoe.....A. L. Steeter  
 Branding and heating iron. Pneumatic.....  
 J. H. Belz  
 Brick kiln.....J. Peck  
 Bricks. Making glazed.....W. E. Jaques  
 Broom bridle.....J. R. Ross  
 Brush.....A. Hart  
 Brush.....T. Brantley  
 Brush and soap holder. Shaving A. Q. Walsh  
 Brush. Traveler's.....W. L. Cheney  
 Brushes or similar toilet articles. Back for...  
 G. F. Kolb  
 Bucket. Clam shell.....E. F. Atherton  
 Bucket dumping apparatus.....T. E. Anderson  
 Buckle. Tug.....F. E. Russell  
 Building block.....J. H. Pfirsich  
 Building. Combination.....L. B. Valk  
 Building construction.....T. O'Shea  
 Buoyant seat or couch.....H. S. Carley  
 Burglar alarm.....G. W. Mills  
 Burglar alarm. Electric.....S. Schwarzschild  
 Burial casket.....A. J. Blair  
 Bushing. Barrel.....F. C. Schoenthaler, Jr  
 Bustle and hip form. Ventilated.....C. H. Scott  
 Buttonhole stitching machine cutting mech-  
 anism.....C. A. Dahl et al

Buttonhole machine.....J. Gutmann  
 Cake teater.....E. E. Ricker  
 Calcining purposes. Kiln or apparatus for...  
 J. R. Horton  
 Calipers, compasses, dividers, &c. Combined  
 H. A. J. Brown  
 Caloric engine.....H. Essex  
 Camera. Film.....O. Mohr  
 Can body blank feed mechanism for can body  
 making machines.....T. J. Harben  
 Can body flanging machine.....H. L. Guenther  
 Can opener.....N. Kalischer  
 Cane and camp stool. Combined.....J. Halin  
 Cape.....C. M. Stein  
 Car brake. Railway.....J. E. Bozell  
 Car controller. Street or railway G. A. Brooks  
 Car coupling.....H. S. Worthington  
 Car coupling.....W. S. Schroeder et al  
 Car. Dump.....F. A. Delano  
 Car. Gondola.....W. H. Woodcock et al  
 Car or vehicle propulsion.....P. Pfell  
 Car roller side bearing.....E. W. Summers  
 Car. Semiconvertible.....G. M. Brill  
 Car step. Sliding extension.....S. Painter  
 Car. Tank.....C. L. Rogers et al  
 Carbonizing apparatus.....G. W. Curtiss  
 Carbureting device for explosive engines.....  
 T. J. Richards  
 Carpet fastener.....S. D. Coster-bader  
 Carriage attachment. Baby.....H. Huston  
 Cash register.....O. F. Mayer  
 Cement and artificial stone composition.....  
 A. C. Schulz  
 Cement. Composition for acid proof.....  
 H. Gallinowsky  
 Cementitious products or artificial stone. Mak-  
 ing.....W. E. Jaques  
 Chain link.....G. Wilke  
 Chair.....A. N. Hornung, Jr  
 Churn.....F. Swallow  
 Clapboard machine.....J. C. Killam  
 Clay mixer and carrier.....J. J. Sullivan  
 Clipper. Hair.....G. H. Coates  
 Clock. Universal.....A. Rosenbusch  
 Clothes or mop wringer.....A. S. Lenna  
 Clutch. Engraver's.....J. Hoffman  
 Clutch. Friction.....J. H. McLennan et al  
 Clutch mechanism.....G. A. Ensign  
 Coke pusher.....E. A. Moore  
 Coke pusher. Double.....F. W. C. Schuwind  
 Collapsible box.....W. Van Horn  
 Collar. Fold.....J. M. Beiermeister  
 Combination heater.....C. A. Mansfield et al  
 Commutators for dynamos or motors. Device  
 filling.....J. B. MacIntosh  
 Compasses.....E. M. Ostlund  
 Concrete flume machine. Rotary.....C. R. Cook  
 Condenser.....A. Snyder et al  
 Conveyor for transporting sand, gravel, &c.....  
 J. W. Titus  
 Conveyor. Passenger.....D. A. Casalonga  
 Copper ores and ores of copper and nickel.  
 Treating.....H. G. C. Thofehr et al  
 Cord or rope coupling.....J. P. Tolman  
 Corkscrew and cork holder.....G. H. Brinton  
 Corn shocker.....J. M. Shively  
 Corset fastening.....E. S. Bowker  
 Cotton chopper and cultivator.....C. E. Delano  
 Cotton chopper and cultivator.....J. N. McAda  
 Crate. Demijohn.....J. J. Clifford  
 Creamer. Centrifugal.....O. Anderson  
 Cryptograph.....L. H. Weston  
 Cryptographic codes. Cipher key for.....  
 H. S. Lewis  
 Crystalizing.....G. E. Stadteger  
 Cuff holder.....C. A. Foster  
 Cultivator.....J. R. Graves  
 Cultivator.....C. L. Swanson  
 Current motor. Alternating.....A. W. Schramm  
 Curtain fixture.....E. A. Kraut et al  
 Curtain support. Storm.....C. M. Abbott  
 Cutter bar.....W. H. Marsee  
 Cutter bar alining device.....J. L. Patterson  
 Damper.....C. A. Dunbar  
 Decoration. Transparent.....C. H. Heartfield  
 Dental cabinet.....D. A. Evans  
 Dental crown holder.....J. W. Place  
 Dental flask.....J. Hood  
 Dental mandrel.....J. Harris  
 Dentists' spreading screw elevator.....  
 H. T. McCune  
 Derrick.....E. P. Arseneau  
 Derrick.....C. J. Reise  
 Desk. Knockdown.....J. Holmes  
 Desk. School.....R. G. Litsey  
 Diaper.....F. L. Reid  
 Die.....E. B. Roth  
 Discount card.....C. J. Huber  
 Door lock and pull. Sliding.....A. J. Butler  
 Doors. Means for closing double action or  
 swing.....F. W. Adams  
 Draining machine.....F. A. Toups  
 Drawing board and T-square.....E. Ellison  
 Drawing frame.....L. J. Wrigley  
 Dredger.....R. A. Perry  
 Drying apparatus.....J. Radcliffe  
 Drill truck mechanism.....W. Fetzer  
 Drilling jar.....F. H. Norris  
 Drilling or tapping machine. Portable.....  
 H. J. Gosling  
 Dye and making same. Brown sulfur.....  
 H. Ebeling  
 Dyeing, &c. Apparatus for.....J. A. Willard  
 Educational appliance.....T. E. Thompson  
 Electric conductor.....J. D. Nicholson  
 Electric furnace.....C. S. Bradley  
 Electric switch.....C. W. Rogers  
 Electrode. Storage battery.....T. A. Edison  
 Electrolytic cells. Operating.....E. A. Le Sueur  
 Elevator door.....E. McClure  
 Embalmer's table.....T. B. Hennessy  
 Endoscope or other optical instrument.....  
 R. H. Wappler  
 Engine boiler. Straw burning traction.....  
 C. E. Chambers  
 Engine controlling apparatus.....R. J. Sheehy  
 Engine cylinder lubricator.....O. Lühr et al  
 Engines. Igniter operating mechanism for ex-  
 plosive.....T. C. Menges  
 Exercising apparatus.....A. J. Thornley  
 Expanding and upsetting tool.....L. D. Lovekin  
 Explosives, celluloid or the like. Manufacture  
 of.....R. Robertson et al  
 Eye. Apparatus for treating the.....H. F. Garey  
 Facing block.....E. E. Reilly et al  
 Fare register.....J. W. Fowler  
 Feed mechanism.....I. K. MacKenzie  
 Feed water regulator. Automatic.....  
 J. H. Rosenthal  
 Feed water regulator. Automatic.....  
 V. F. Casey et al

Feed water regulator. Automatic.....H. Cook  
 Fence machine. Wire.....W. T. Gaines  
 Fence post.....W. S. Barker  
 Fence post.....S. L. Eason  
 Filter. Down spout.....W. H. Otis  
 Filter. Hydrocarbon.....G. W. Stewart  
 Filter. Water.....J. W. Burns  
 Filter. Water.....D. J. Bliss  
 Fire hydrant.....C. E. Jones  
 Flagstaff cap and truck. Combined.....  
 A. A. Bregel  
 Flue cutter.....T. W. Hinde  
 Fluid pressure brake.....M. W. Hibbard  
 Flute.....A. Kranitz  
 Foot ball.....W. S. Jacobs  
 Foot pad.....W. J. Conway  
 Fruit jar.....G. H. Ricke  
 Fruit picker.....D. C. Eberhart  
 Fuel. Artificial.....H. M. Van Etten  
 Fumigator.....G. E. Brown  
 Furnace.....E. A. Field et al  
 Furnace.....A. W. Straight et al  
 Furnace grate.....C. P. & G. P. Roberts  
 Fuse splitter and cap crimper.....J. Fischler  
 Galvanic battery. Reversible.....T. A. Edison  
 Game.....C. W. Fuller  
 Garbage vault or receptacle.....E. L. Schiefer  
 Garment supporter.....A. H. Cohn  
 Garment supporter.....H. A. Hoopes  
 Gas burner. Incandescent.....A. Grossmann  
 Gas furnace.....E. S. Clower  
 Gas furnace. Recuperative.....L. C. Hamlink  
 Gas generator. Acetylene.....A. Schweitzer  
 Gas generator. Acetylene. 2 pats.....  
 G. W. MacKenzie  
 Gas generator and lighting buoy. Combined  
 acetylene.....J. J. Luyten  
 Gas lighter.....A. P. Storrs  
 Gas reversing valve.....C. N. Rauschenberg  
 Gas valve.....L. M. Moore et al  
 Gases. Apparatus for indicating the thermal  
 quality of.....W. F. Steele  
 Gate.....F. M. Dann  
 Globe or shade holder.....W. Wishart et al  
 Glove.....R. Wilkens  
 Golf club.....F. B. Felton  
 Golf club.....A. F. Knight  
 Goods. Means for packing.....E. & F. Franz  
 Governor. Speed.....C. E. Sterne  
 Grain drier.....J. G. King et al  
 Grain separator.....C. B. & C. T. Hixson  
 Grate.....C. N. Nunan  
 Grease trap.....A. S. Newton  
 Grinding, smoothing, roughening, and polish-  
 ing machine.....R. Ochsbaum  
 Gun. Automatic machine.....T. Bergmann  
 Gun carriage.....J. F. Meigs et al  
 Gun carriage for portable guns.....J. Krone et al  
 Gun. Magazine bolt.....S. N. McClean  
 Gun sight.....J. Smith  
 Guns. Mechanism for feeding cartridges into  
 machine.....T. K. North  
 Guns, &c. Sighting device for.....  
 J. B. de Mesquita  
 Hame fastener.....J. H. Parmelee  
 Hammer. Vibrating.....H. M. Baldwin  
 Harmonica shell. Mouth.....M. Messner  
 Harvester and shocker. Corn.....  
 I. D. Highleyman et al  
 Harvester binder bundle carrier and shock  
 former.....L. T. Derry  
 Harvester. Traveling.....W. C. Matteson  
 Hat pin.....H. J. Nickett  
 Hatchway doors. Means for operating.....  
 W. K. Wilcox  
 Hay press. Hand.....J. M. Hall  
 Head rest.....J. D. Smock  
 Heating material.....E. G. Acheson  
 Heel. Detachable.....M. H. Sullivan et al  
 Hinge. Seat.....L. D. Petre  
 Hoist.....G. C. Hunter  
 Hook.....D. T. Goodman  
 Hopple.....C. M. Wales  
 Hose coupling.....P. Whiting  
 Hot air furnace.....W. C. Reynolds  
 Ice harvesting machine.....J. B. Hause  
 Ice machine. Regealed.....C. P. Minning  
 Igniter.....G. H. Lotspike  
 Indicator for furnaces, &c.....A. E. Powell  
 Indicator lock.....P. Yoe  
 Inhaler.....K. Greimer  
 Inhaler.....A. K. Schulte  
 Injector. Steam.....F. Sticker  
 Insect exterminator.....H. H. Boring  
 Insulators. Machine for producing glass.....  
 T. C. Duffield  
 Internally fired engine. 2 pats.....E. Thomson  
 Ironing board.....H. J. Hinderliter  
 Jar closure.....W. E. Brown  
 Jars, bottles, &c. Stopper for.....C. Jovignot  
 Jars. Means for closing air tight A. F. Wilson  
 Kiln, furnace, &c.....J. Roberts  
 Kneading and mixing machine E. F. W. Wieda  
 Knife cleaning means.....C. Heywood  
 Lamp bulbs, &c. Packing for incandescent...  
 R. Gair  
 Lamp. Carriage.....E. M. Rosenbluth  
 Lamp. Colored signal.....J. J. Sill  
 Lamp. Electric headlight.....H. P. Wellman  
 Lamp. Hanging.....C. M. Pitel  
 Lamps. Edison screw switch holder for incan-  
 descent.....O. Zielinski  
 Lapping machine.....R. J. Hill  
 Lathe. Engine.....J. H. Montstream et al  
 Leveling staff.....K. Hein  
 Lever jack.....W. Trehwella  
 Lifting device. Article.....F. G. Neumann  
 Liquid fuel furnace.....A. Wengenroth  
 Lock.....C. W. Marr  
 Lock and latch. Combined.....J. Fish  
 Loom. Pile fabric.....A. Turkington  
 Mail bundling device.....G. W. Hagan  
 Maltng apparatus.....F. B. Giesler  
 Massage appliance.....T. Schillberg  
 Match box.....W. T. Wilson  
 Measuring and conveying coal, &c. Apparatus  
 for.....B. Leslie  
 Measuring device. Shoemaker's J. T. Bradley  
 Measuring electrical resistance. Apparatus...  
 for.....R. W. Conant  
 Meat holder.....J. C. Shearer et al  
 Mechanical movement F. L. & H. J. Eberhardt  
 Medicated substances. Holder for.....H. Sachs  
 Melting furnace.....F. H. Daniels  
 Metallurgical and chemical furnace.....  
 C. A. Doremus  
 Metals from ores. Extracting.....S. Trivick  
 Milk aerator.....A. J. Hood  
 Milk powder. Producing.....H. V. Dunham  
 Mines. Apparatus for changing winding ropes  
 in.....A. Beien



Molding machine. Founder's.....J. Reid, Jr.  
Molding machine. Sand.....F. W. Hudson  
Money saving box or purse.....G. Smith  
Moth trap.....R. F. Dull  
Mowing machine cutting device.....J. W. Latimer  
Mowing machine windrowing attachment.....J. F. Steward  
Music box stop mechanism.....G. A. Brachhausen  
Musical instrument. Automatic mechanical.....G. A. Brachhausen  
Nail.....J. W. Estes  
Net. Landing.....G. Paley  
Nippers.....W. J. Bayrer  
Nut.....O. C. Duryea et al  
Nut lock.....A. Kissinger et al  
Nut lock.....W. Stinson  
Nut lock.....C. L. Durboraw  
Oil cakes. Apparatus for packing.....A. W. French  
Ores. Concentrating.....2 pats H. E. Campbell  
Oven. Baker's.....C. Bosmer  
Oven. Baker's.....J. M. Fischer  
Overweight register.....J. Roller  
Packing and transportation carrier, trunk, or the like.....G. W. Peck  
Packing device for drill rods, &c.....B. Selfridge  
Packing. Piston rod.....G. P. Kline  
Padlock.....2 pats J. Roche  
Padlock case.....J. Roche  
Paper doll.....K. V. Betts  
Paper machine suction box.....H. Fairbanks  
Paper pail.....E. B. Weston  
Paper slitting machine.....L. F. Fales  
Paper stock engine knife spacer.....M. P. Van Ryzin et al  
Passe partout frame.....F. E. Maine  
Pen. Fountain.....G. W. Perks et al  
Penholder.....J. Knox  
Pencil holder.....H. H. Weaver  
Penmanship charts.....W. Thomson  
Petroleum and petroleum distillates. Purifying and desulfurizing crude.....T. F. Colin et al  
Piano.....B. K. Korik  
Piano or similar instrument.....S. W. Clark  
Piano player's key striker.....O. F. Hintz  
Pickles. Making.....W. A. Loder  
Picture frame.....R. Benziger  
Picture frame. Adjustable.....C. H. Strauss  
Pin shafts with heads of glass. Machine for providing.....T. W. Jungbecker  
Pipe cleaner.....J. Sincock  
Pipe coupling.....C. S. Johnson  
Pipe joint. Expansion.....H. J. Wessinger  
Pit scrap. Apparatus for handling.....F. E. Parks  
Planter. Potato.....F. S. McWhorter  
Plover.....H. D. Terrell  
Pneumatic despatch receptacle.....E. C. Gipe  
Pole and shaft.....G. A. Schenck  
Pole or shaft.....J. G. Lovejoy  
Poultry fountain.....S. E. Cogswell  
Power shears. Combined split and bar cutting.....I. Grimm  
Power transmitter.....E. T. McKaig  
Press after pressing device.....F. Wally  
Pressure gage.....C. J. Manning  
Printing device. Automatic roll paper.....G. H. Dworzek  
Printing machine. Color.....G. Schneider  
Printing merchants' advertising cards on wrapping paper. Device for.....N. T. Pool  
Printing press cutting and punching mechanism.....G. H. Pierce  
Printing press feed controlling attachment.....S. R. Kramer  
Projectile.....N. Denler  
Propelling mechanism. Boat.....J. M. Story  
Pruning shears.....J. H. Wiles  
Pulley block.....J. Z. Benedict  
Pulley. Sash.....P. Dosch  
Pump.....W. A. Kerfoot  
Pump.....S. B. Leidy  
Pump for raising liquids by compressed air.....2 pats C. F. Simon  
Pumps. Relief valve attachment for oil well.....E. R. Graham  
Pumping apparatus.....D. W. Jones  
Pumping engine.....E. Hill  
Punching machine.....W. H. Parker  
Purse lock.....S. K. Grover  
Puzzle.....L. A. Svenson  
Rail bonding tool.....S. H. Harrington  
Rail joint.....J. C. W. Bischoff  
Rail joint.....G. L. Matheney  
Rail joint nut lock.....F. Chamberlain  
Rail support.....W. E. Jaques  
Railway. Electric.....H. Edwards  
Railway interchangeable turnout.....D. E. Pepin  
Railway. Pleasure.....J. T. Truitt  
Railway rail fish plate joint.....W. F. Bossert  
Railway rail joint.....D. R. Page  
Railway switch. Electric.....G. W. Linder  
Railway tie.....R. A. Huron  
Railway wagon coupling.....C. Gebers  
Railways. Means for operating the points of overhead wires on electric H. & C. W. Collins  
Railing post anchor.....W. Hamman  
Reaping and mowing machine.....P. W. Kenny  
Reeling machine.....G. Sipp  
Register fastener.....E. H. Arend  
Resistance box.....S. S. Wales  
Rheostats and heaters. Automatic release device for.....C. E. Freeman  
Rings, buttons, &c. Interchangeable top for initial or insignia.....G. G. Ackerman  
Rotary cutter.....J. Eitinger  
Rotary engine.....A. P. Anderson  
Rotary engine.....E. W. Cooley  
Rotary engine.....H. T. Dunn  
Rotary engine. Reversible.....G. A. L. Lind  
Rotary motor.....F. C. Watson  
Rotary steam engine.....T. Bayley  
Roving frames, &c. Stopping mechanism for.....T. Bentley  
Rub apron for rub-rolls.....H. W. Tuttle  
Rubber glove. Seamless.....J. Pfeiffer  
Saddle and driving box. Spring.....E. N. Slocum  
Safe.....W. B. McKenna  
Saw clamp or vise.....C. R. Walter  
Sawmill set works.....T. S. Wilkin  
Sawing lumber.....J. C. Killam  
Scale. Computing.....F. J. Englen  
Scraper. Road.....J. D. Olcott  
Screw cutting machine. Self adjusting.....T. Murray  
Screw driver or kindred tool.....P. H. Garrity  
Seal. Vessel.....E. P. Cooke  
Sealing and applying stamps to envelopes. Machine for.....W. L. Rowell, Jr  
Seam trimmer. Back.....C. B. Corwin  
Seeder. Onion.....I. McCollister  
Self waiting table.....M. V. Hammack

Sewing machine.....E. Ilg  
Sewing machine attachment holder.....P. Joecken et al  
Sewing machine bobbin controlling mechanism.....A. Steward  
Sewing machine hem folder.....A. Laubscher  
Sewing machine loop taker.....W. F. Dial et al  
Shade cutter. Window.....L. C. Thompson  
Shade fixture. Window.....T. J. Spencer  
Shade roller holder. Adjustable.....E. Chabot  
Shades and rollers. Machine for reducing the width of window.....J. A. Bradford  
Shaker or mixer.....F. L. Williams  
Shaving glass.....W. B. May  
Sheet metal cutting and shaping machine.....G. C. Mohr  
Shell. Shrapnel.....A. H. Emery  
Shingle carrier.....A. O. Bartlett  
Shingle guide.....A. Sivertson  
Shrapnel, shells, &c. Smoke generator for.....C. V. Schou  
Side board rod fastening.....S. S. Bolton  
Sign. Electric display.....F. M. Sheridan et al  
Sign. Moving advertising.....T. P. Thompson  
Signaling device. Electric.....W. Fraser  
Skirt supporter.....V. J. King  
Slate.....C. B. Tompkins  
Smoke consuming furnace.....E. W. Berry  
Smoke, fumes, or gases. Apparatus for condensing.....W. B. Jackson  
Smoothing irons. Heat controller stand for electric.....2 pats J. I. Ayer  
Soldering iron stand. Electric.....J. I. Ayer  
Soldering machine. Can.....J. G. Hodgson  
Sole rough rounding and channeling machine.....J. L. Kieffer  
Speed mechanism. Reversible and variable.....J. Banwell  
Spike.....D. Servis  
Spool stop motion device.....J. B. Underwood  
Spoon holder.....H. Powles, Sr  
Spraying coating or coloring fluids. Apparatus for.....C. J. Wittig  
Stairway or elevator. Moving spiral.....L. G. Souder  
Station indicator.....E. G. Schwarz  
Steam coils, &c. Detachable leg for.....G. W. De Staebler  
Steam generator.....E. Thomine  
Steam pressure engine.....W. E. J. Vavasour  
Steam trap.....J. T. Lindstrom  
Steel. Manufacture of.....H. G. C. Thofehrn  
Steel. Producing.....P. Eyermann  
Stick adapted for self defence.....W. Freh  
Still.....C. H. McCormick  
Stocking.....L. C. Calkins  
Storage battery.....2 pats E. A. Sperry  
Storage battery.....J. B. Eutz  
Stove. Oil.....O. Thacher  
Straw conveyor.....H. J. Talmage  
Strength testing device.....J. Matland  
Sulfuric anhydrid. Apparatus for making.....W. C. Ferguson  
Sulfuric anhydrid. Making.....W. C. Ferguson  
Supporter.....M. Van Duyn  
Supporting and locking device.....J. B. Johnson  
Switchboard. Sectional electrical.....T. W. Jardine  
Syringe. Hypodermic.....F. S. Dickinson  
Tea leaf holder.....R. C. Lawson et al  
Teaching telegraphy. Educational device for.....G. W. Newmann et al  
Telephone key.....W. E. Duncan  
Telephone attachment.....J. P. Riedinger  
Telephone receiver adjustable support.....F. J. Becker  
Telephone receiver holder.....S. Konigstein  
Telephone receiver support.....D. W. Shiek  
Telephone toll register.....G. A. Long  
Telephonic apparatus. reissue.....C. G. Bourke  
Temperature regulating apparatus.....W. P. Powers  
Tender and tank locomotive.....K. Goldsorf  
Therapeutic blanket. Electric thermal.....W. E. Williams  
Thermometer case.....A. Ashenberger  
Thill coupling.....A. H. Worrest  
Thread cutter and tie.....J. B. Underwood  
Threshing machine 3 pats.....J. B. McCutcheon  
Tire armor. Pneumatic.....H. Parsons  
Tire fastener.....G. E. Rumrill  
Tire. Vehicle.....W. Clapp  
Tobacco smoking pipe.....F. Holland  
Tool. Compound.....L. Vick  
Tool holder.....L. Vick  
Toy.....H. Metzger  
Toy.....A. Strenitz  
Toy.....A. L. Stone  
Toy gun.....M. Anthony  
Toy gun.....E. Hazlehurst  
Transit.....L. H. Abbee  
Transom lifter.....O. N. Eaton  
Transom lifter.....H. Osborne  
Trolley.....H. H. Bryant et al  
Trolley reverser.....F. H. Burnham  
Trolley wheel.....N. T. Hazen  
Trousers.....A. G. Larkin  
Trousers or skirt hanger.....F. H. Cowles  
Truck bolster and bolster frame. Car.....G. G. Floyd  
Truck. Car.....E. W. Summers  
Truck. Railway.....W. H. Wolf et al  
Tube expander.....F. Lamplough  
Tug. Thill.....W. A. Crist  
Tunnel construction.....J. W. Reno  
Type holder.....H. S. Folger  
Type writing machine.....J. D. White  
Valve.....E. Deruntz  
Valve and brake system. Check.....P. Whiting  
Valve. Cylinder.....P. Whiting  
Valve. Dry pipe.....C. B. Garrett  
Valve for hot water systems. Check.....J. J. Lawler  
Valve for tank cars, &c. Discharge.....C. O. Rowley  
Valve. Supply.....E. A. Marsh  
Valve. Throttle.....K. Rushton  
Valve. Water cooled.....C. P. Byrnes  
Vapor burner reservoir.....W. Mitchell  
Vaults. Internal mold for burial.....T. R. Millison  
Vehicle power transmitting mechanism. Motor.....R. Symmonds, Jr  
Vehicle running gear.....E. L. Farris  
Vehicle top.....J. H. Sprague  
Vending machine.....W. Webber  
Vending machine coin drawer.....C. L. Hurd  
Voting machine.....J. Boma  
Wagon body.....J. P. Johnson  
Walls. Wind box for bridge.....F. J. Gordon  
Washing machine.....M. L. Stoddard  
Washing machine.....C. P. Lancaster

Washing machine.....A. A. Casler  
Water closet.....H. O. Krakow  
Water elevator.....F. B. Van Cleave  
Water gage. Self recording.....O. C. Patton  
Weaver. Calif.....G. C. Birmingham  
Wells or like purposes. Apparatus for drilling.....G. H. Spaulding  
Windmill.....J. J. Middlesworth  
Windwill governor.....P. I. Storvik  
Window.....P. L. Hultmark  
Wire cloth holder.....H. M. Keim et al  
Wire stretcher.....C. L. Cox et al  
Wood bending press.....F. H. Bancroft  
Wood carving machine.....L. S. H. Charrier

## DESIGNS.

Buckle or brooch plate.....J. Catlow  
Furniture panel or upright.....J. Kepler  
Furniture support or bracket.....J. Kepler  
Furniture upright or support.....I. Kepler  
Plate or similar article.....C. J. Ahrenfeldt  
Spoon. Souvenir.....P. A. Haberl

Issued March 31, 1903.

## MECHANICAL PATENTS.

Acid and metallic oxides. Producing sulfuric.....H. S. Blackmore  
Air. Apparatus for simultaneously supplying heated and refrigerated.....J. W. Titus  
Alarm and annunciator.....R. J. Dodd  
Alloy.....J. Stevenson, Jr  
Alloys. Making.....J. Stevenson, Jr  
Animal shackle.....T. E. Jones  
Arch supporter.....O. Booth  
Aural instrument.....R. M. Shaffer  
Automobile vehicle.....H. Lemp  
Awl. Sewing.....M. R. Botkin  
Baling machine. Hay.....F. W. Williams  
Baling press.....L. Trabue et al  
Baling press tension band.....L. Trabue  
Basket. Fruit.....S. J. Dunkley  
Baskets, &c. Fastening for.....A. A. Benedict  
Battery plates. Producing storage.....W. Gardiner  
Bearing. Antifriction thrust.....W. R. Cunningham  
Bearing. Roller.....R. L. Ellery  
Bearing. Submerged gudgeon.....I. F. Davis  
Bedstead corner joint.....G. Brand  
Bell. Door.....C. B. Pace  
Belt, collar, &c. Lady's.....E. O. Whittlesey  
Belt. Machinery.....G. E. Preston  
Belt shipper.....O. L. Owen  
Bicycle.....D. M. Small  
Binder.....J. O. Deckert  
Binder frame.....J. O. Deckert  
Binder. Temporary.....H. H. Willson  
Binding machine. Pamphlet.....J. W. Butterfield  
Bleaching plant. Cell for electrolytic.....L. E. Lander  
Blowpipe burner.....H. S. Burton  
Boiler setting. Steam.....E. Gibson  
Boiling apparatus. Water.....R. C. Sayer  
Bookkeeping.....J. C. Macnamara  
Boring machine.....R. W. Lyle  
Bottle cleansing machine.....J. H. Koehler et al  
Bottle destroying stopper.....F. Birchbauer  
Bottle washer.....H. S. Brewington  
Bottle with spherical or ball valve stopper.....A. W. Woodward  
Bottles, jars, &c. Closure for.....A. L. Weissenthanner  
Box fastener.....W. Baker, Sr  
Box fastener.....J. M. Sias  
Branding machine.....H. Goehring  
Brick.....G. Hering  
Brush machine.....3 pats E. F. Abbey  
Bucket or pail. Collapsible.....E. C. Brown  
Buggy step.....E. Besse  
Burial case for caskets. Outside.....C. W. Neudorff et al  
Burial casket handle.....M. F. Davoran et al  
Butter cutter.....P. M. Scanlan  
Button pad.....J. A. Stuart  
Cabinet and examining or operating table. Combined.....G. H. Prindle  
Cabinet. Kitchen.....A. K. Wilson  
Cabinet. Sheet metal.....C. Stollberg  
Cabinet. Sheet metal carton.....C. Stollberg  
Calculating machine.....D. J. T. Hiatt  
Camera. Photographic.....G. N. Collins  
Can capping machine.....F. L. Baker  
Cane cutting machine.....T. W. Sloane  
Cap.....C. S. Tobias  
Car coupling.....T. I. Duffy  
Car coupling and train pipe coupling combined.....D. B. Granbery  
Car. Dump.....J. P. Rhodes  
Car. Dumping.....J. B. Rhodes  
Car fender safety device. Trolley.....D. P. Powell  
Car replacer.....T. Maroney  
Car replacer.....J. H. Fowler  
Cars. Switch burner for traction railway.....T. W. Heatley  
Carpet stretcher.....J. A. Sandy  
Carpet sweeper.....C. King  
Cartridge carrier.....E. Krough et al  
Cartridge packet.....C. H. A. F. L. Ross  
Cartridge recapper.....J. B. Crepeau  
Cash register.....F. C. Osborn  
Cash register.....J. P. Cleal  
Cash register.....P. Lalor  
Casting cylinders.....A. Walder et al  
Catch for instrument cases, &c.....H. L. Curren  
Cattle guard.....E. Cook  
Cellulose films or filaments. Preparing.....F. A. Lehner  
Centerboard.....A. P. Stokes  
Centering support. Extensible.....G. B. Waite  
Centrifugal separators. Driving mechanism for spindles of.....M. L. Hoyt  
Chain. Drive.....F. W. Schirmer  
Checkrein fastener.....G. C. Wyland  
Cheese cutter and slice discharger.....J. H. Rose  
Cherry stoner.....J. G. Baker  
Churn.....I. M. Murphy  
Churn.....C. J. Edney  
Churn. Double dasher.....A. J. Williams  
Churn. Rotary.....J. T. Marsh  
Cigar wrapper cutting mechanism.....O. Tyberg  
Cigars. Manufacture of.....B. Wertheimer  
Clip for attaching goods to ropes or rods.....H. W. Metcalfe  
Closet seat.....J. Hansen  
Closet seat catch.....F. M. Alexander  
Clothes draining device.....C. Shefferd  
Clothes drying apparatus. Centrifugal.....F. J. Bird

Coach windows, &c. Antirattling cushion for.....I. H. Mulford  
Coal bag. Canvas.....W. M. Morris et al  
Coating metal with silver. Composition for.....E. D. Kendall  
Coating with metal.....E. D. Kendall  
Coin controlled machine.....E. de Kleist  
Coin controlled machine.....B. Holz, Jr  
Coin wrapper.....C. A. Herr  
Coke oven.....G. F. Myers  
Coke oven watering apparatus.....D. B. Stauff  
Collar fastener.....W. M. Shewry  
Collar. Horse.....P. Olson  
Combing machine.....J. W. Nasmith  
Composition of matter.....S. Richman  
Condenser. Jet.....L. R. Alberger  
Controlling mechanism.....A. P. S. Macquisten  
Conveyer.....A. M. Acklin  
Conveyer. Reciprocating.....F. H. Schule  
Copper from ores. Separating.....G. D. Van Arsdale  
Copper leaching.....G. H. Waterbury  
Cordage machine.....W. H. Avis  
Core cutting machine.....E. R. Smith  
Cores. Machine or appliance for forming.....W. Jones et al  
Corn husker and shredder.....G. W. Tice  
Corset.....S. Meyer  
Cotton chopper.....T. M. Short  
Cream separator and churn. Combined.....W. Ferguson  
Cremating putrescible waste materials. Apparatus for.....W. M. Wheildon  
Crutch. Tubular metal.....J. Conn  
Cultivator.....A. A. Thorgersen  
Current regulator. Alternating.....T. E. Adams  
Cut out.....O. B. Williams  
Cutting device.....H. Del Mar  
Damper mechanism. Time.....E. S. & G. B. Walker  
Dental flask.....J. H. Feagan  
Dental handpiece.....W. Homann  
Dental mold.....W. Streetman  
Dictionary. Thesaurus.....J. W. Buel  
Die stock.....J. J. Mullany  
Dish washing tray.....N. G. Blackwood  
Display rack.....W. E. Lambden  
Dividers.....J. C. Edgar  
Door check and closer.....J. L. Pearl  
Door closer and check.....J. Bardsley  
Door hanger.....M. C. Richards  
Door spring.....J. H. Anderson  
Doors. Rotary fly brush attachment for screen.....S. G. Scholz  
Dough making and mixing machine.....W. S. & C. I. Corby  
Draft device.....T. V. Elliott  
Draft equalizer.....O. Sanoden  
Draw bar attachment.....F. C. Anderson  
Dress shield.....S. E. King  
Dresser.....J. L. Larson  
Dye and making same. Azo.....A. Bertschmann  
Egg beater.....C. Bentley  
Electric accumulator plates. Making.....J. J. H. Hunte  
Electric circuit breaker.....J. J. Wood  
Electric conductor tile or conduit.....R. W. Lyle  
Electric current controller.....L. Bradley  
Electric furnace.....R. Winter  
Electric generator attachment.....E. A. Terpening  
Electric light pole attachment.....I. Levi  
Electric machines. Pole shoe for dynamo.....A. Churchward  
Electric switch.....G. W. Hart  
Electrodes. Manufacture of.....J. J. Heilmann  
Electrolytic deposition. Composition of matter for.....E. D. Kendall  
Elevator door.....H. Bitner  
Elevator gate operating mechanism.....J. E. W. Fogal  
Elliptical spring.....E. B. Smith et al  
End gate. Dumping.....H. Boyd  
End gate rod.....J. H. Lyford  
Engine or motor.....F. W. Rogier  
Envelop. Postal.....A. M. Pelletreau  
Evaporator.....E. R. Edson  
Expansion bolt.....N. H. Steward  
Explosive engine.....C. W. Weiss  
Exterminator.....F. MacFarland  
Eyeglass nose guard.....R. B. Finch  
Fair stitch machine.....E. F. Mower  
Fall rope carrier.....M. Bradford  
Fan.....C. A. Eck  
Fare registering apparatus.....G. A. Owen  
Faucet. Registering.....N. H. Eiler et al  
Feed cutter.....A. T. Heck  
Feed or water pan. Poultry.....F. B. Mills  
Feed water heater.....F. C. Trauer  
Ferruling hose and product thereof.....G. H. F. Schrader  
File. Index card.....C. A. Evans  
File. Paper.....W. H. Sheffield  
Firearm attachment.....R. M. G. Phillips  
Firearm magazine. Repeating.....H. Harris  
Fire escape.....L. H. Hebert  
Fire escape ladder.....R. Schapler  
Fishing gear link.....A. W. Wilson  
Fishing reel.....E. D. Rockwell  
Flasher and circuit therefor. Electric.....H. C. Hortsman  
Fluid agitator.....A. P. Barney  
Fluid mixing apparatus.....G. A. Loeben  
Folding box.....L. L. Claxton  
Forceps. Hemostatic.....W. L. Nuttall  
Fortune telling attachment.....C. L. Hurd  
Fruit wrapper and making same.....E. Davenes  
Fuel. Artificial.....W. B. Smith  
Furnace feeding apparatus.....2 pats C. W. Bray  
Fusible pattern.....F. Baldt, Sr  
Gaiter. Congress.....E. L. Keith  
Game apparatus.....J. M. Babbitt et al  
Game apparatus.....E. Truslow  
Game apparatus.....E. Braden  
Garment.....G. J. Hudson  
Garment fastener.....N. J. Young  
Garment fastener.....G. Schmitt  
Garment hanger.....T. M. Mulkerins  
Gas and tar separator.....E. A. Moore  
Gas. Apparatus for producing motive power from liquid.....G. B. Fraley  
Gas cooler.....E. A. Moore  
Gas engine.....A. H. Dingman  
Gas engine. Compound.....J. Babled  
Gas generating system.....C. Whitfield  
Gas generator. Acetylene.....2 pats N. Goodyear  
Gas generator. Acetylene.....F. M. Ashley  
Gas lighter. Automatic.....S. H. Malpas  
Gas pressure in burners Apparatus for regulating the.....M. Offenbergl  
Gas producer.....C. H. Morgan



- Gas producing plant..... F. E. Bowman  
Gate..... J. Y. McKinney  
Gear, Compensating..... T. J. Lindsay  
Gear, Variable speed..... F. Miller  
Gearing, Variable..... A. Peteler  
Glass articles. Manufacture of hollow..... W. J. Greenwood  
Glass bottles. Machine for making..... L. Grote  
Glass bottles. Machine for manufacturing..... T. W. Simpson  
Glass. Making sheet..... H. G. Slingluff  
Glazing system..... H. W. Waldmire  
Golf ball..... A. R. Spear  
Governor, Hydrocarbon engine..... C. W. Weiss  
Grain binder..... J. W. Webb  
Grain cradle..... H. L. Hewitt  
Grain dislodger..... H. E. Koch  
Grain. Treating..... H. J. Caldwell et al  
Grinding or amalgamating mill muller..... E. F. Knotts  
Grocery bin..... A. Monahan  
Ground roller..... F. B. Moore  
Gun brake. Fluid..... A. Resow et al  
Guy clamp..... T. E. Hallett  
Gun recoil apparatus..... E. K. Rothe  
Gun stock. Cushioned..... O. F. Ermel  
Hair drying apparatus..... J. A. Grant  
Halter..... D. O. Fosgate  
Hammer, Blacksmith's forging..... C. Jewell  
Harvester and husker, Corn..... A. Forgy  
Harvester, Bean..... W. H. Wilder  
Harvester, Cotton..... R. Cannan  
Harvester, Cotton..... J. J. Faulkner  
Hat blocking machine..... A. B. Waring  
Hat body forming machine..... A. B. Waring  
Hat fastener..... A. Fleeger  
Hat or cap shaping block..... H. H. Wolf  
Hay shock ventilator and safety stack bottom..... S. P. White et al  
Heater and steam generator. Combined D. Cline  
Heel..... G. B. Grover  
Heel for boots or shoes. Compensating..... R. Wynell  
Heel nail..... H. Briggs  
Hinge, Spring..... W. G. Peterkin  
Hinge washer. Antifriction..... E. A. Moore  
Hitching device, Horse..... G. W. Sheehan  
Hobby horse and merry-go-round..... T. Sulikx  
Hoe, Garden..... F. Vaydl  
Horseshoe..... T. C. Octigau et al  
Horseshoe pad..... J. M. Lord  
Hose coupling..... E. T. Parsons  
Hose coupling..... G. Hirschell  
Hot air pipe..... A. G. Scherer  
Hot air pipes. Moistening device for..... J. S. Rogers  
Hot water bag..... J. H. Holt  
Hydrocarbon burner..... J. F. Higgins  
Hydrocarbon burner..... C. K. Berge  
Incrustation preventive..... R. L. Gamlen  
Incrustation preventive and method of manufacture..... A. Raymond et al  
Indicator wheel..... W. G. Kirchhoff  
Induction apparatus..... P. F. Cowing  
Injector pipes, &c., Straining attachment for..... C. H. Gary  
Insect trap..... S. R. Estep  
Insole..... R. W. Evans  
Insulated strain..... L. Steinberger  
Insulating bodies. Producing electric..... H. Biehn  
Insulator..... R. H. Polk  
Invalid lifter and conveyer..... P. W. Dohoney  
Jar cap tool..... J. G. Rosenberg  
Jar closure..... W. E. Brown  
Jar holder, Fruit..... H. W. Bogart  
Joint support..... R. Stanton  
Journ bearing..... E. J. Decker  
Junction box..... R. S. Donaldson  
Kite frame Metal..... H. H. Stein  
Knitted underwear, Union..... J. Pennington  
Knob rose..... H. G. Voight  
Lace fastener, Shoe..... J. Hennessey  
Lamp, Alternating current arc..... T. E. Adams  
Lamp, Electric arc..... T. E. Adams  
Lamp, Electric arc 2 pats..... J. J. Wood  
Lamp for railway cars, Signal..... R. Black  
Lamp for railway cars, Signal, F. W. Dressel  
Larynx. Instrument for intubation of the..... F. E. Sampson  
Latch..... M. W. Dodge  
Laundry device..... J. A. Treat  
Lever, Gripping..... W. H. Carter  
Life preserver..... B. Goldstein  
Life preserving garments, Inflatable air bag for..... H. Kuhlmann  
Lightning arrester..... H. M. Shaw  
Liquid fuel burner..... J. G. Branch  
Liquid raising apparatus..... A. Schoell  
Liquid separator liner, Centrifugal..... W. W. Marsh et al  
Lock and escutcheon..... W. Chalmers  
Locomotive, Combined steam and compressed air..... E. Hill  
Loom, Filling replenishing, 2 pats..... J. Northrop  
Loom, Filling replenishing H. T. Hunnewell  
Loom finger mechanism..... Z. L. Chadbourne  
Loom picker motion..... E. E. Sullivan  
Loom rod guide..... D. C. Norcross  
Loom shuttle welf case..... W. H. Baker et al  
Loom thin place detector mechanism..... D. W. Denny  
Loom weft controlling mechanism, 2 pats..... F. E. Kip  
Looms by the quantity of weft in the shuttles Means for controlling..... J. H. Klerx  
Lubricating trolley for wire rope railways..... R. Pfaffenbach  
Mail box..... A. G. Stinson  
Mail box..... J. H. Forney  
Mail carrier..... E. Horst  
Mail crane..... R. Hinges  
Manifold device..... D. W. McGregor  
Manifold sheet..... R. J. Copeland  
Match igniting material..... W. Muir et al  
Match safe, paper holder, and cigarette machine, Combined..... W. R. Hamper  
Mattress frame..... J. P. Lein  
Measuring device..... R. Parkinson et al  
Meat cutter..... H. G. Voight  
Mechanical movement..... J. Hofmann  
Mixing machine..... H. C. Chambers  
Molding apparatus..... C. E. Hancock  
Molten material and distributing the same, Device for cutting..... H. Brooke  
Molten material. Receptacle for containing..... H. Brooke  
Mortise gage..... J. A. Bengtson  
Motor controlling mechanism..... C. S. Cole  
Motor for automobiles, &c 2 pats C. S. Cole et al  
Motors in dust laden atmospheres. Means for operating..... T. A. Edison  
Mowing machine..... G. K. Flower  
Muffler, Exhaust..... W. J. Perkins  
Musical instrument accompanist..... D. Cavicchioli  
Musical instrument automatic playing attachment..... T. P. Brown  
Non conducting covering..... W. M. Zitt  
Nut lock..... H. G. Buch  
Nut lock..... J. O. E. Krohn  
Nut lock..... J. T. Pearman  
Nut lock..... C. Weichold  
Nut lock..... J. Marshall  
Oar lock..... A. W. Knapp  
Oculist's or optician's trial frame..... S. G. Marshutz  
Oil, Apparatus for separating naphtha from..... E. R. Edson  
Oil burner..... R. F. Schroeder  
Oil burner..... C. K. Berge  
Oil tank attachment..... C. Moller et al  
Ore concentrator..... F. W. Harlow  
Ore concentrator, Centrifugal..... P. H. Shue  
Overalls or netter garment..... N. Ravich  
Package, Shipping..... J. T. Ferres  
Packing and packing case, Piston rod..... J. H. Lewis et al  
Packing machine..... G. R. Wyman  
Packing, Piston rod..... G. F. Allen  
Packing, Semimetallic..... A. L. Cole  
Pail, Dinner..... E. Frank  
Panchromatic dry plate and making same..... A. Miethe et al  
Pantograph..... M. Barr  
Paper cutting machine..... C. Seybold  
Pencil sharpener..... F. H. Lippincott  
Permutation lock..... J. Roche  
Pew..... E. T. Kervick  
Photochemical and electrotherapeutical apparatus..... A. E. Sterne  
Picture exhibitor, Coin controlled..... J. C. A. Riecke  
Pigment and making same, W. J. Armbruster  
Pigments, Making..... W. J. Armbruster  
Pipe clamp..... W. L. Partington  
Pitching apparatus..... S. C. Spangler  
Plaiting heavy webs, Machine for..... D. L. Chandler  
Plaiting machine roll..... D. L. Chandler  
Planing machine..... E. Wuhrmann  
Planter attachment, Corn..... E. T. Fry et al  
Planter, Corn..... J. W. White  
Plow and seed planter, Combined lister or breaking..... C. T. Sylvester  
Plow beam attachment..... E. Hall  
Plow point..... G. N. Moody  
Plow, Reversible..... F. Wiegard  
Poke, Animal..... G. Gramkow  
Portable house..... J. D. Horton  
Potatoes, fruits, &c., Apparatus for assorting..... E. Byusse  
Power, Apparatus for regulating fluid pressure for the application of..... J. F. Ellis  
Power transmitting mechanism..... F. Sedivy  
Precious metals, Apparatus for extraction of..... J. Baxeres de Alzugaray et al  
Printing press plate holder..... H. A. Maley  
Printing press, Platen..... R. E. & A. Kemper  
Projectile..... W. Pepperling  
Protractor..... C. L. Kline  
Pulverizer and harrow, Combined O. M. Bird  
Pump..... H. P. Sanderson  
Pump controller, Electric..... C. F. Dew  
Pump piston or plunger..... O. P. Berry  
Pump, Rotary..... E. F. Smith  
Pyrographic burner..... F. A. Reichardt  
Pyrography, Poker or branding tool for use in..... H. Freytag  
Pyrometer..... J. Whiting  
Rail joint..... G. Godsell  
Rail joint..... J. J. Manton  
Railway crossing signal..... N. Perrault  
Railway rail fastening device..... A. Vogelsang  
Railway rail joint..... F. E. Waterson  
Railway signal..... D. M. Snyder  
Railway tie, Composite..... J. C. Currier  
Railway tie, Metallic..... S. S. Wood  
Railway tie, Steel..... F. L. Teel  
Ram, Hydraulic..... P. W. & E. H. Foster  
Ratan splitting machine..... C. W. Gay  
Recording device..... J. O. Decker et al  
Reflector, Show case..... M. Taussig et al  
Refrigerator..... L. R. Blackmore  
Refrigerator..... J. M. McCool  
Rein support..... I. M. Priest  
Rendering tank..... E. R. Edson  
Reversing mechanism..... C. J. Cook  
Road bed..... I. Haws  
Road making and repairing machine..... J. B. & B. O. Rhodes  
Rolling pin..... R. Lowe  
Rolling, Steel or other metal..... W. Cooper  
Rotary engine..... G. J. Scott  
Rotary engine..... A. L. Treese  
Rotary engine..... J. Wiechmann  
Rotary grate furnace..... J. MacCormack  
Rubber fabric for heels, &c..... M. A. Kennedy  
Sack cleaner..... W. B. Schuyler  
Sash fastener..... R. K. Brown  
Sash lock..... E. H. Dimock  
Saw handle..... O. B. Craft  
Saw side dressing device..... F. A. Bell  
Saw swage..... E. P. Armstrong  
Scaffold for window washing, &c..... J. C. Crow  
Scraper, Wheeled..... W. S. Livengood  
Screw driver..... H. Berquist  
Seal lock..... J. L. Pellington  
Sectional boiler..... J. L. Armitage et al  
Sewing machine, Hemstitch..... C. M. Abercrombie  
Sewing machine, Overedge..... G. Keyser  
Sewing machine, Overedge..... G. Keyser et al  
Sewing machine, Overedge..... G. Keyser et al  
Sewing machine presser foot, Eyelet..... D. Noble  
Sewing machine thread cutter..... E. H. A. Habbert et al  
Sewing machine trimmer..... D. Noble  
Sewing machine trimming attachment, Loop-ed fabric..... G. Keyser  
Shade device, Window..... A. L. Moyer  
Shade roller support..... J. Renner  
Sharpener, Combination knife and scissors or shears..... M. L. Hawks  
Shearing machine..... S. V. Huber  
Shears for cutting corrugated sheet metal..... T. M. Robinson  
Shells, Machine for making tubular..... C. E. Ingals et al  
Shirt waist..... A. Levi  
Shoe fastener..... G. Hirschell  
Show case..... J. U. Lasso  
Show case, Combination..... S. E. Parrish  
Shutter fastener..... O. F. Immell  
Sidewalk elevator..... J. Reig  
Signaling apparatus..... H. A. Fessenden  
Sizing, Preparing..... T. Aspinall  
Skins and furs, Apparatus for depilating..... A. Billand  
Smoke bell..... C. Haynes  
Smoke consuming furnace..... J. C. Smith  
Smoke jack..... A. D. Colton  
Snap hook..... R. W. Hubbard  
Spacer and matrix..... M. Reid  
Spectacles..... J. C. Anderson  
Speed changer..... W. L. Schellenbach  
Spindle driving mechanism..... E. E. Bradley  
Spool, thimble, and cushion rack..... Z. G. Shelton  
Spring..... G. H. Howell  
Spring brake..... J. A. Field  
Spring motor..... C. H. Hoyt  
Spud or vertical anchor..... C. E. Fowler  
Stacker, Hay..... J. H. Cope  
Stacker, Pneumatic..... J. Henry  
Stacker, Straw..... J. Heineke  
Starting gate..... D. J. Pine  
Steam boiler and its setting..... H. M. Ashley  
Steam engine..... J. W. Nowak  
Steam trap..... W. Khlebnikov  
Steam trap..... J. G. Branch  
Steel marker, Pressed..... N. P. Cowell  
Steel, Rephosphorizing..... J. Stevenson, Jr  
Stereoscope..... H. E. Richmond  
Storage battery..... J. M. Allen  
Store service apparatus..... W. L. Churchill  
Stovepipe fastener..... F. H. Busby  
Stovepipes, Clamping collar for use in cutting holes in..... G. W. H. Hughes  
Strainer, Milk..... J. W. Barth  
Stropping machine..... A. W. Scheuber  
Sugar, Electro endosmotic process of extracting..... B. Scherwin  
Sugar solutions, Boiling..... H. Claassen  
Switch apparatus and valve therefor, Pneumatic..... L. Griffith  
Switch light..... A. Frantzen et al  
Switch operating device..... J. M. Wilbur  
Switch operating mechanism..... J. M. Wilbur  
Switch system, Controlling A. L. De Leeuw  
Syringe for dental or other uses..... A. E. Buchanan  
Tag..... R. G. Crosby  
Targets, Apparatus for operating moving..... J. W. Porter  
Telephone attachment for telegraph lines..... E. Russel  
Telephone call system..... E. A. Terpening  
Telephone, signal, burglar, and fire alarm, Combined..... B. O. Fox  
Tension..... W. H. Hasemeyer  
Testing plug..... A. T. Pflugh  
Therapeutical work, Electrical apparatus for..... H. Jackson  
Threshing machine straw stacker..... J. Heineke  
Tiles for floors, walls, &c., Combination..... R. L. Moyle  
Timber at the surface of the ground, Machine for cutting..... J. H. Young  
Tire cover, Pneumatic..... L. Johnstone  
Tire detacher..... A. W. Blanchard  
Tire, Pneumatic..... P. W. Tillinghast  
Tire, Resilient..... H. Carmont  
Tire valve and cap..... G. H. F. Schrader  
Tool, Compound..... C. H. Dreher  
Tool holder..... H. Driebehaus  
Towage, Electrical traction..... S. W. Wood  
Towage, Electrical traction way for canal..... S. W. Wood  
Towage traction way, Electrical..... S. W. Wood  
Toy..... H. Wittmann  
Toy, Sounding..... J. S. Patten  
Toy wagon..... E. F. Kapus  
Train order holder..... C. A. Luckfield  
Transforming system..... N. Thomas, Jr  
Trimmer..... W. N. Gartside  
Trolley wheel..... J. Hengen  
Trousers presser and creaser..... E. M. Martin  
Truck for moving buildings..... J. T. Marsh  
Truck, Mill..... E. Whalley  
Truck, Radial car..... R. L. Ellery  
Truss..... M. E. Jasper  
Tubular bodies, Apparatus for producing..... H. Ehrhardt  
Tuft making machine..... W. M. Pettit  
Tunneling, Submarine..... H. A. Carson  
Turning machine, Automatic wood..... R. W. Barker  
Twine holder..... J. A. Thompson  
Type writer attachment..... W. V. King  
Type writer, Shipper's..... W. W. Frantz  
Typewriting machine card controlling attachment..... R. K. Slaughter  
Typewriting machine ribbon feeding and controlling mechanism..... J. A. Smith  
Typewriting machine ribbon guiding, guarding and shifting mechanism..... C. F. Lagauke et al  
Typewriting machine tabulating mechanism..... J. A. Smith  
Undergarment, Union..... J. Pennington  
Universal joint, Double..... H. D. Williams  
Valve..... E. H. Foster  
Valve..... H. F. Shaw  
Valve and valve operating mechanism..... C. E. Cook  
Valve, Balanced slide..... J. T. Wilson  
Valve, Differential high pressure direct pass..... O. Abeling  
Valve, Engineer's air brake controlling..... J. Lipkowski  
Valve, Explosion engine mixing..... M. Pivert  
Valve, Gate..... J. A. Anderson  
Valve, Gate..... A. Smith  
Valve gear..... G. Howard et al  
Valve, Motor relief..... C. S. Cole  
Valve, Throttle..... J. B. Michael  
Valve, Trap controlling..... R. G. McAuley  
Valve, Lifting gear for Spring pressure safety..... J. E. Lonergan  
Vehicle steering mechanism..... 2 pats..... A. A. Ball, Jr  
Vending machine..... J. A. Joyce  
Vise..... C. W. Orvis  
Vise, Woodworker's..... E. Wright  
Voting machine..... E. E. Ritchie  
Wagon brake..... W. N. Secord  
Wagon, Dump..... F. L. Nicoulin  
Warp stop motion mechanism..... G. A. Collins  
Washing machine..... J. Mackenzie  
Watch winding indicator..... F. E. Mistrot  
Water closet flushing tank attachment..... J. D. Rockwell  
Water trough..... C. C. Knobel  
Waterway, Pleasure..... A. Pusterla  
Weaner, Calf..... C. J. & C. C. Quinn  
Weather strip..... R. H. Whitted  
Weeder, Wheel..... S. Fuller  
Weighing machine, Coin controlled..... 2 pats..... J. T. Witek  
Well boring drill..... W. H. Clark et al  
Wheel fender..... B. F. Schmoldt et al  
Windmill..... O. S. Church  
Window..... 3 pats..... H. C. Smith  
Window cleaning device..... C. M. R. Sy  
Window frame and sash, Metallic..... 2 pats..... H. C. Smith  
Window frame, Metal..... H. C. Smith  
Window screen..... B. S. Bullis  
Wire drawing die..... J. Howe  
Wire stretcher..... S. L. Harris  
Wood, Ornamenting..... G. C. Vachon  
Work clamp..... D. C. Fisher  
Wort separator..... M. Henius  
Wrench..... F. G. Wetterstein  
Yeast for use in the manufacture of yeast by the aeration or clear wort process, Production of seed..... H. Jansen

## DESIGNS.

- Badge..... E. E. Bower  
Bottle..... C. C. Bonnert  
Button or similar article..... C. A. L. Totten  
Dish..... G. C. Thiesen  
Dish, Salad..... G. C. Thiesen  
Dish or similar article, Covered..... C. J. Ahrenfeldt  
Display fixtures for stores..... 5 pats..... H. G. Roth  
Picture frame..... R. Benziger  
Pillow cover, Sofa..... N. Y. Hamilton  
Plate or similar article..... G. C. Thiesen  
Plate or similar article..... C. J. Ahrenfeldt  
Stool..... 4 pats..... C. D. Orcutt

## Attention Inventors!

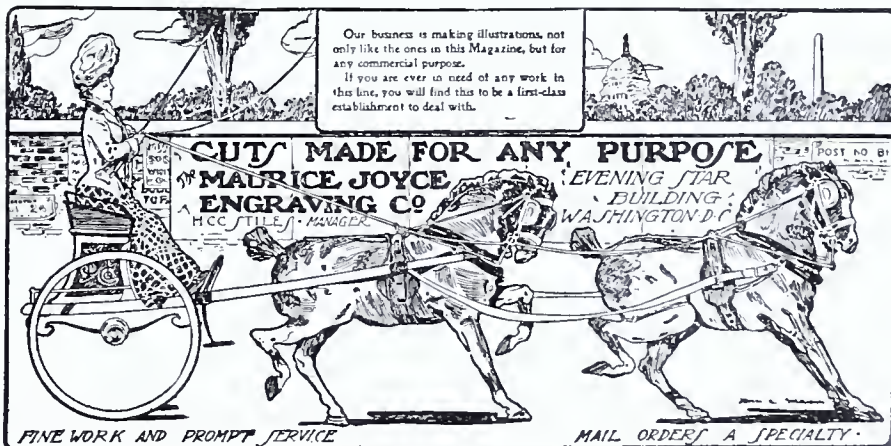
## LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

Charge, fifty cents to one dollar, depending on size of list.

In ordering, please state class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.





# A Remarkable Offer

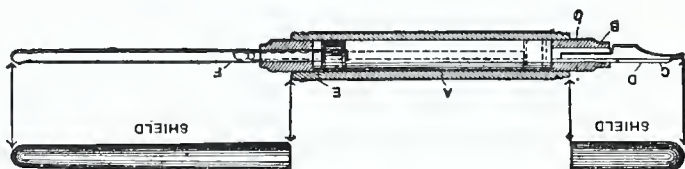


## The "POST" SELF FILLING FOUNTAIN PEN.

No Filler. No Soiled Fingers. No Lost Time. Simple and Perfect.

### THIS IS ITS CONSTRUCTION

IT IS AWAY AHEAD OF ANY OTHER PEN MANUFACTURED BECAUSE OF ITS SELF-FILLING AND SELF-CLEANING FEATURES.



BEING THE ONLY ONE MANUFACTURED HAVING THESE CONVENIENCES.

We will send this famous pen, postpaid, and one years subscription to "The Inventive Age," for \$2.00.

Every Inventor in the country needs The Inventive Age, and everyone needs a pen. Here's your chance to get a bargain.

There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the "Post" has secured. We have testimonials that a million dollars could not buy. In the list will be found leading men in politics, finance, law, religious movements, literary men, bankers and business men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the "Post" and in terms of praise simply unqualified. Send for list of testimonials.

Address: **THE INVENTIVE AGE Publishing Co.**

918 F St. Northwest,  
Washington, D. C.

### Our Great Popular Offer!

...A....

## Complete Electrical Library

By PROF. T. O'CONOR SLOANE.

...A...

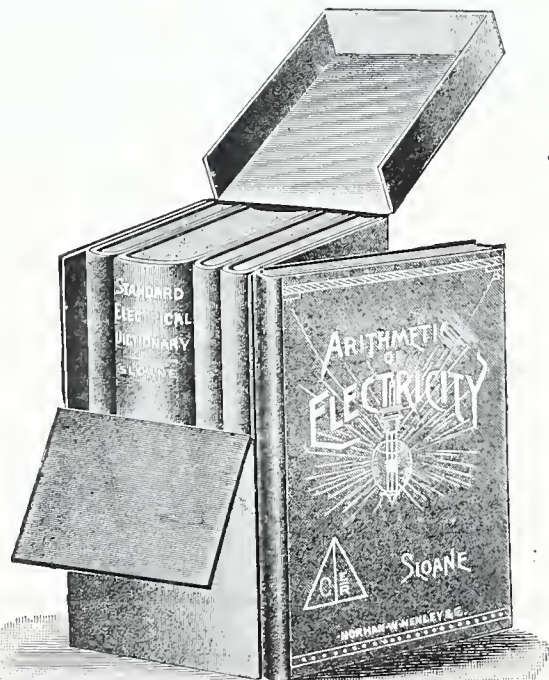
\$7.00

Library

for

\$5.50.

Comprised by  
the following  
books:



5 Volumes,

1300 Pages,

Over 450

Illustrations.

Electricity Simplified .....	Price 1.00	Our Great Special Offer.—We will send prepaid, the above five volumes, handsomely bound in blue cloth, with silver lettering, and enclosed in a neat folding box, as shown in the illustration, at the Special Reduced Price of \$5.50 for the complete set. The regular price of the five volumes is \$7.00
Arithmetic of Electricity.....	1.00	
Electric Toy Making.....	1.00	
How to Become a Successful Electrician.....	1.00	
The Standard Electrical Dict'y	3.00	

\*Order direct from us while the opportunity lasts. Any of the above books sold singly at the published prices. You save \$1.50 by ordering the complete set from us. Sent prepaid on receipt of price. Remit by draft, postal money order, or express order.

Address: **THE INVENTIVE AGE Pub. Co.,** 918 F Street, N. W., Washington, D. C.

## MECHANICAL - - - - MOVEMENTS, Powers, Devices and Appliances:

By Gardner T. Hiscox, M. E. Price \$3.00.  
Author of "Gas, Gasoline and Oil Engines."

Large 8vo.

Over 400

Pages

Handsomely

Bound in Cloth.



1,649 Specially  
Made

Illustrations

With Descrip-  
tive Text.

PRICE, \$3.00

A **DICTIONARY** of Mechanical Movements, Powers, Devices, and Appliances, embracing an illustrated description of the greatest variety of mechanical movements and devices in any language. A new work on illustrated mechanics, mechanical movements, devices, and appliances, covering nearly the whole range of the practical and inventive field, for the use of Machinists, Mechanics, Inventors, Engineers, Draughtsmen, Students, and all others interested in any way in the devising and operation of mechanical works of any kind.

Sent to any address on receipt of price.

Address: **INVENTIVE AGE Pub. Co.,** 918 F. St., N. W., WASHINGTON, D. C.



ANNIVERSARY  
NUMBER

A JOURNAL  
OF MANUFACTURING  
INDUSTRY

# THE Inventive Age AND PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 5.

WASHINGTON, D. C.—MAY, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

## Views on the Siberian = = Railway. = =

THE SIBERIAN RAILWAY, whose construction has been watched by the world for years, and whose final opening to regular traffic has been frequently postponed, has now a steadily established service for the accommodation of passengers and freight. One cannot hope, it is true, to take a train on any day on which one may happen to arrive at St. Petersburg and be sure of an uninterrupted journey. Through trains from Moscow to Dalny, for instance, are run only once a week; though it is expected that the traffic will soon justify the increase of this service to two trains a week. One can take a train daily at Vladivostock, Dalny, Port Arthur or Niuchwang for St. Petersburg, if one is content to travel by accommodation train, in second class cars, for over a third of the six thousand mile journey, or as far as Lake Baikal. Inasmuch as the trip consumes, under the most favorable conditions, fifteen or seventeen days,



Engine built in Russia to pull the first class train through Manchuria.

linen: soap should on no account be omitted. The speed of the regular trains averages only 15 miles an hour, with stops, and this cannot be increased with safety until the rails are at least one-third heavier than those now in use, and properly ballasted. Efforts are being made, however, to strengthen the line and to extend the first class service. The number of passengers carried—mainly emigrants from Russia who have been persuaded by Government inducements to colonize tracts of land in Siberia—as well as tons of freight, has surpassed all expectations; and it is probable that the road will turn out to be a financial success, which is more than was hoped for, as it was built for political and strategical purposes in the great game that the European powers are playing in Asia.

The accompanying illustration shows an engine—built in Russia—to pull the first class train over the Siberian railway. The funnel shaped smoke-stack will remind readers of the engines in use twenty years ago in this country, and still in vogue in rural districts. The second illustration shows second and third class cars, with moujiks about to board the train, and an official, with the inevitable long-skirted Russian blouse and fur cap, waiting for orders. The third is a railway station, of modern brick construction, in the far-eastern section of the road, in Manchuria. The last is



A second and third class train on the railway in Manchuria.

and as the scenery beheld from the car windows is said to be in the highest degree uninteresting—the succession of dreary steppes being as monotonous, though not as restful, as the view from the deck of an ocean steamer—the traveler will probably desire not to prolong it more than is possible. On special occasions, one can obtain first class service for the entire route: but for the most part, one must be content, during the transit between Irkutsk and the Pacific, with very primitive accommodations. Even on the sleeping cars that cover the road from St. Petersburg to Irkutsk, travelers are advised to take lunch baskets with them, as well as their own bed



Siberian train entering the ferry to cross Lake Baikal.



Russian Railway Station in Manchuria.

a view of the Siberian railway entering the ferry boat that conveys it across Lake Baikal. It is expected that within a year a track will be laid around the southern end of the lake, and the journey can proceed uninterruptedly on rail: but at present travelers must traverse the eighty miles of water that represent the width of the lake by boat in summer, or by means of horses and sledges in winter. It is worthy of note that the railway traverses, besides Lake

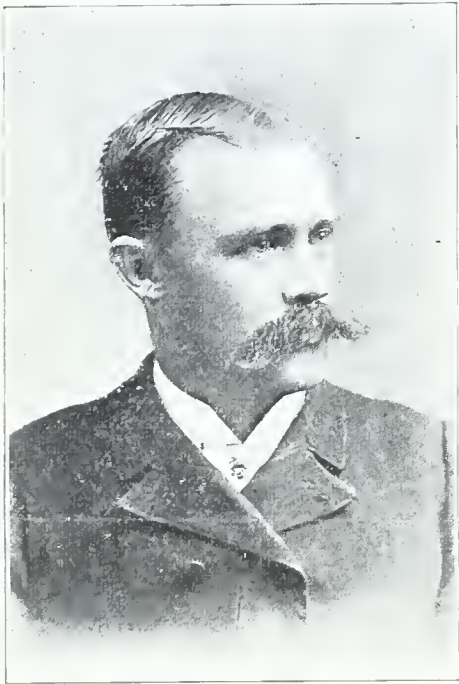
Baikal, seventeen rivers of importance, necessitating over thirty miles of bridges: one over the Irstich, being 2,300 feet in length.



## A SELF-MADE MAN.

What Brains and Enterprise Can Accomplish. The Largest Envelope and Box Factory in the World.

DURING the Napoleonic era it was said of French soldiers that every private had the possibility of a Marshal's baton in his grasp; and it can also be said of every American citizen that fame and fortune, or both, await him. That more do not reach the goal is due to lack of diligence and not to lack of opportunity. The lives of self-made men are always an interesting study, and the life of the one who is the subject of this article is particularly so because of the humble surroundings of his early life, and the marvelous success to which he has attained.



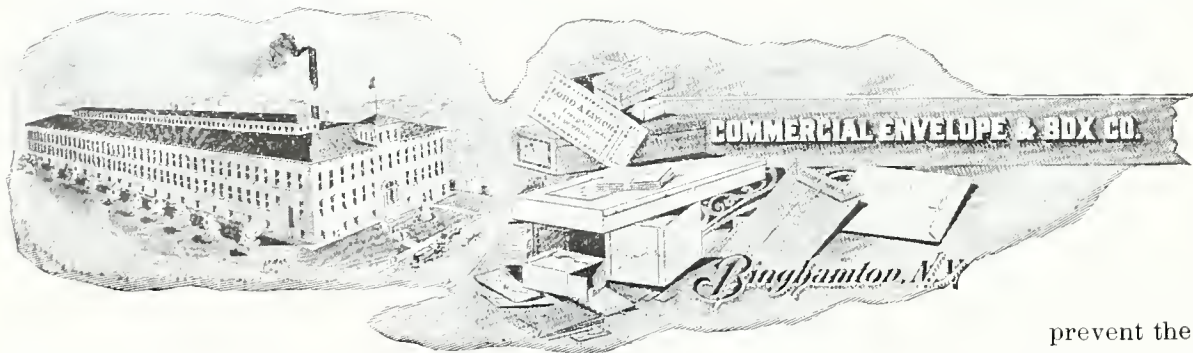
BENJAMIN B. MCFADDEN,

Benjamin B. McFadden, of Binghamton, N. Y., was born in Harrison County, Ohio, August 4, 1862. He left home when only nine years old and began peddling prize packages of envelopes and pencils, traveling through Ohio, West Virginia, Indiana and Illinois, and finally landed in Chicago. He obtained a position in the Deering Harvester Works located in

Captain Paine's colony, traveling through Texas with his camping outfit, through the Indian Territory, Missouri, and when he reached Kansas City he disposed of his team and went on the lecture platform and continued speaking until 1890.

At this time he became interested in inventions and completed and obtained a patent on a reversible envelope. He went to New York City, formed a corporation for the exploitation of the envelope, selling the stock himself. The Commercial Envelope Company, Limited, was organized in 1890, and the business was located at 23 University Place, New York City, with a capital of \$12,000; but the company, under the management of its president, Mr. Benjamin B. McFadden, soon outgrew its quarters, adding a floor at a time until it occupied the entire building. Requiring still more room, the business was moved in 1893, to 97 Sixth Avenue, where it continued to grow until it occupied the entire building of four floors 50x100 feet, and did business in these quarters for seven years. Still requiring additional room to take care of the growing business, the company decided to move to Binghamton, N. Y., on account of better shipping facilities, less cartage and a steadier class of labor. They erected a factory in Binghamton with about 10,000 feet of floor space with a railroad switch running into it. After three years, the factory was found to be less than 25 per cent of what the company required, and plans were then completed for the present new building as per the accompanying illustration, which, with the adjoining buildings, occupies about 50,000 square feet on the northwest corner of a four acre plot of ground within half a mile of the courthouse, which is in the center of the city. Two street car lines pass the factory and three railroads run into the plant.

The envelope and box structure is completed and sufficient ground is reserved for the purpose of building a paper mill, which will be completed in the near future. The present plant



that city, and served three years as a machinist. When the concern shut down its plant, he went into Iowa, and without having any previous experience, or even any special training, he began sketching and painting houses, carriages and signs, and finished up as a fresco artist and landscape painter with a studio in Cleveland, Ohio, where he remained about ten years.

In 1884 he crossed the plains and went through Colorado, down the Arkansas Valley to Wichita, Kans., and from there into Oklahoma with

has a capacity of a car load of goods every nine hours, and is working at full capacity. The factory is the largest building under one roof in this line of business in the country. The dimensions are 555 feet by 60 feet. The factory is located on the east side of the Delaware and Lackawanna, on the tract of land known as the Whitney estate. It stands 140 feet back from Robinson Street, commencing at the Binghamton and Syracuse railroad, running 150 feet east and 360 feet south. It is surrounded by maple trees which are thirty feet higher than the building, the latter being a three story structure. The first story of the building is concrete, the other two

stories are red brick, pointed up in red cement. The growth of the business in a few years from a small concern to one of the largest in the country seems remarkable. The causes contributing to its marvelous growth are untiring effort, the quality of goods manufactured, and "keeping everlasting at it." The most potent factor in the development of the concern was Mr. McFadden himself, and those who have the pleasure of his acquaintance given him the whole credit for success. He is the President of the Binghamton Board of Trade, and is recognized as one of the leading citizens of Binghamton.

Mr. McFadden is married and has three children.

Mr. McFadden has recently taken out two patents on folding boxes which are regarded as leaders in their respective classes, being sold to the largest dry-goods stores in the country, also to manufacturers of every description of goods. His patent work since the year 1900 has been attended to with great satisfaction to him by E. G. Siggers, of Washington, D. C.

### Slate Pencils.

In making slate pencils broken slate is put into a mortar run by steam and pounded into small particles. Then it goes into a mill and runs into a "bolting machine," such as is used in flouring mills, where it is "bolted." The fine, almost impalpable flour that results is taken to a mixing tub, where a small quantity of steatite flour similarly manufactured, is added, together with other materials, the whole being made into a stiff dough. This dough is thoroughly kneaded by passing it several times between iron rollers. Thence it is conveyed to a table, where it is made into "charges" or short cylinders, four or five inches thick and containing eight or twelve pounds each. Four of these are placed in a strong iron chamber or "retort" with a changeable nozzle so as to regulate the size of the pencil, and subjected to tremendous hydraulic pressure, under which the composition is pushed through the nozzle in the

shape of a long cord and passes over a sloping table set at right angles with the cords to give passage to a knife which cuts them into lengths. They are then laid on boards to dry, and after a few hours are removed to sheets of corrugated zinc, the corrugation serving to

prevent the pencil from warping during the process of baking, to which they are next subjected in a kiln, into which superheated steam is introduced in pipes; the temperature being regulated according to the requirements of the article exposed to its influence. From the kiln the articles go to the finishing and packing room, where the ends are thrust for a second under rapidly revolving emery wheels, and withdrawn neatly and smoothly pointed. They are then packed in pasteboard boxes each containing 100 pencils, and these boxes are in turn packed for shipment in wooden boxes containing 100 each, or 10,000 pencils in a shipping box. Nearly all the work is done by boys.—*Cement & Slate.*

### Electric Power in Darkest Africa.

In November, 1855, when Dr. Livingstone and Mr. Oswell reached the Zambesi, the wondrous Victoria Falls of that river were, for the first time, looked upon by European eyes, and these British travellers gave to them the name of the late Queen. They had often heard of the falls, known by the natives as "Mosi oa tanya" ("Smoke does sound there") since they first entered the country; but the exact locality was not accurately known. In fact, the natives regarded the falls with such awe that they viewed them only from a distance, whence they could observe the great columns of spray and hear the distant roar as the cascade fell into the stupendous gorge. In their simplicity the natives supposed that the spray was smoke, and they asked Dr. Livingstone whether in his country there was such a thing as "smoke that sounds."

The entire width of the falls is about a mile, the height is from 400 to 420 feet, as against 167 feet of Niagara Falls, and when the river is in flood, it is estimated that the volume of water is about double that of Niagara, giving about 35,000,000 H. P. as running to waste. During the dry season this is much reduced; but, even in the driest years, the volume passing over the lip is very large. In the proposed electrical development of the falls the power house would be placed on a benching below the cascade, and would be supplied with water by steel tubes from the falls. Any amount of power required could be obtained, and an available head of at least 250 feet could be utilized. Each pipe or tube, 8 feet in diameter, would drive a turbine and generator necessary for 5000 horse-power and it would probably be found desirable to lay down the plant in units of this magnitude. The ultimate site of the power house would have to be determined by the demand for electricity in the neighborhood.

Gold mines to the southeast, the coal mines of Wankie, and the important copper deposits in Barotseland, which are believed likely to prove among the greatest in the world, would all require power to a very large extent. Chemical and metallurgical industries will be attracted, as they have been at Niagara, and, if alluvial gold deposits exist, as reported, in the vicinity of the falls, they might be cheaply worked by "hydraulic," the washing down the beds by powerful water jets supplied by electrically driven pumps.

Water would also be required for irrigation, and ploughing, sawing timber, and all kinds of agricultural work could be carried on by electrically transmitted power. The great need for manufacturing on the spot all the various products which can be obtained by electrical energy is at once apparent when it is remembered that at the present time, these have to be obtained from America and elsewhere and transported thousands of miles, by sea and land, to the numerous points of consumption within a moderate distance of the Victoria Falls. In other words, both the necessary materials and the power are at the very doors of the Rhodesian population and need only to be rightly developed.—*Cassier's Magazine.*



## ORIGIN AND ORGANIZATION OF THE UNIVERSAL EXPOSITION AT SAINT LOUIS.

THE SUCCESS OR FAILURE OF THE EXHIBITS OF THE MANUFACTURING INTERESTS OF THE COUNTRY AT THE UNIVERSAL EXPOSITION AT ST. LOUIS 1904 DEPENDS UPON THE CO-OPERATION OF THE EXHIBITORS, AND UPON THE EFFORTS OF THE THREE MEN WHOSE PICTURES ARE GIVEN BELOW. THE CHIEF OF THE DEPARTMENT OF MANUFACTURES COMES INTO DIRECT CONTACT WITH THE MANUFACTURERS; ABOVE HIM STANDS THE DIRECTOR OF EXHIBITS, AND OVER HIM, THE PRESIDENT OF THE EXPOSITION COMPANY.

Of all the great expositions of the nineteenth century, the one to be held at St. Louis in 1904 begins with probably the brightest future. Not the least of the many reasons for its assured success is the personnel of its organization. The proposition of inaugurating a celebration to commemorate the purchase of the Louisiana Territory from Napoleon Bonaparte was first definitely brought to the attention of the public in 1897; but the first step towards definite action was taken by the Missouri Historical Society which appointed, in 1898, a committee of fifty to consider the possibility and manner of such celebration. This committee appointed a sub-committee of four to arrange for a convention of like committees appointed by each state in the territory of the Louisiana Purchase for this same purpose. Among the members of this committee of four of Missouri, was the president of the now organized Louisiana Purchase Exposition Company, Hon. David R. Francis.



HON. DAVID R. FRANCIS,  
President Louisiana Purchase Exposition Company.

Through the direct and indirect efforts of this committee of four the plan of a celebration grew until the citizens of St. Louis had subscribed \$5,000,000, the city of Saint Louis \$5,000,000, the

government of the United States over \$6,000,000 and the State of Missouri \$1,000,000. The subscribers to the \$5,000,000 elected a board of directors numbering ninety-three (93) none of whom are to receive any compensation for their services. These ninety-three men represent the heads of the most successful business enterprises in the city, and cover every line of industry. Never before was such a representative body of men drawn together for the purpose of creating an exposition; and never before, it may truthfully be said, has a World's Fair been launched with such backing. In the judgment of this exceptionally strong directory, the men most capable of personally directing the enterprise were the Hon. David R. Francis, who was elected President, and William H. Thompson, who was elected Treasurer of the Exposition Company. The former had been Mayor of St. Louis, Governor of the State of Missouri and a member of President Cleveland's Cabinet; he is at present a director in many of the important financial institutions of the city and its acknowledged foremost citizen. Mr. Thompson is President of the National Bank of Commerce, an institution with a capital and surplus of \$8,500,000, and is a controlling director of numerous other leading St. Louis enterprises.

The Executive Committee of the Exposition Company, of which these two officers are members, is composed of twelve of the most prominent and important business men of the city, selected from the Board of Directors. Various other committees, covering all phases of the Exposition work, are made up from the remaining members of the Board.

In addition to this organization of the original Exposition Company, a special Exposition Commission was appointed by President McKinley to represent the United States Government in the administration of the affairs of the Exposition. This commission consists of nine representative men carefully selected from different sections of the country and is known as the Louisiana Purchase Exposition Commission. The title of the incorporated company—the Exposition Company proper—is "The Louisiana Purchase Exposition Company." The approval of the Government Commission is necessary to all the important business connected with the Exposition.

The executive committee, acting in conjunction with the various other committees, has selected an executive working force for the Exposition, to create, collect and install it, heading the force with four controlling directors, as follows: Director of Exhibits, Director of Exploitation, Director of Works and Director of Concessions and Admissions. Following the Executive Divisions further, there is, under the Division of Exhibits, a staff of Chiefs of the various Departments of

exhibits of the Exposition, all under the control of the Director of Exhibits. This expert working force will procure and install all of the exhibits of the Exposition.



FREDERICK J. V. SKIFF,  
Director of Exhibits, Universal Exposition at St. Louis, 1904.

The personnel of this special exhibit staff insures the success of this important and colossal work. The Director of Exhibits, Mr. Frederick J. V. Skiff, is well known to the commercial world,—especially to all who have ever had anything to do with expositions. He was Director-in-chief of Exhibits for the United States at the Paris Exposition of 1900, receiving as recognition for his services there from the French Government the high decoration of Officer of the Legion of Honor. He was also Chief of the Department of Mines and Mining and later Deputy Director General of the World's Columbian Exposition at Chicago in 1893, which position he assumed after resigning his office as National Commissioner to that Exposition.



MILAN H. HULBERT,  
Chief Department of manufactures, Universal Exposition at Saint Louis, 1904.

The Chief of the Department of Manufactures, Mr. Milan H. Hulbert, is also well known to those who have taken part in expositions. Besides having been an exhibitor at many of the important recent expositions, he was Chief of the Department of Manu-

factures for the United States at the Paris Exposition of 1900, when he received the decoration of Chevalier of the Legion of Honor from the French Government. He is in every way well equipped for the discharge of the important duties which will fall to his hand as head of this prominent department of the Exposition.

The Chiefs of all of the other departments are equally representative and well selected for their special tasks, detail mention of them being omitted here, as the readers of this article are particularly interested in the Department of Manufacturers.

With such strength in its organization, from the Chief of each Department in the Division of Exhibits through the Director of the Exhibits to the President of the Exposition Company, and supported and advised by a capable Board of Directors and by the National Commission, it is not surprising that the Exposition is taking on such proportion. If present evidence means anything, there is little doubt but that Saint Louis will have the greatest of all World's Fairs in its Universal Exposition of 1904.

### German Fire Extinguisher.

An engineer of Munich, Mr. Max Eberhardt, gave recently a demonstration of the effectiveness of a new preparation for extinguishing fires. The trials were successful. The preparation is a liquid of a milky color. The first experiment showed that the skin, when painted with the liquid, becomes insensible to heat. Rags saturated with petroleum can be burned upon the hand after it has been immersed in the liquid. Small fires can be extinguished with the hands, and with one pailful of the liquid, a fire in a pit of tar was put out in one second. The tar, even after petroleum had been poured over it, could not be again ignited, as the liquid formed a thin, unmeltable crust which completely shut out oxygen. In the fourth experiment, a pile of wood several yards in height and width was ignited until it was in full blast. The fire was completely extinguished in twelve seconds with a little more than 12 gallons of the liquid.

Small quantities of the preparation are sufficient for extinguishing purposes, so that the damages produced by water are avoided.

The price of the liquid is about 0.75 cent per quart. The trial took place in the presence of the chiefs of the fire department and representatives of the city council and board of public works.

### Dye for Gloves.

The processes usually employed in dyeing gloves use an excessive quantity of coloring matter, as the leather is dyed throughout. There is also the danger that the leather will shrink and lose elasticity. A recent German patent claims to solve the difficulty by employing a solution of the pigment in benzol. Three parts of an aniline dye, which is soluble in fat, are dissolved in 200 parts of benzene: the solution is carefully mixed with a paste of antiseptic soap and alcohol. The gloves are stretched, cleaned with benzene, and then dyed by immersing in the above mixture, if they are white in color. If they have already been dyed, the mixture is applied with a brush.



## SCIENTIFIC

## PROGRESS.

## Dust-Proof Motor.

In the operation of electric motors of various sorts in atmospheres which are heavily charged with dust, as in cement grinding establishments, flour mills, and the like, great care has to be exercised to protect the bearings and moving parts from the effect of the dust, and particularly when the latter is of a hard gritty nature. This has been generally accomplished by the use of so called "dust proof" motors: but these are unsatisfactory, and in time become seriously impaired, besides being relatively expensive. Furthermore, the closing in of the armature, commutator, and brushes to make them dust proof interferes with the proper and desirable ventilation of the motors, which therefore become objectionably heated, and hence, operate inefficiently. As a matter of fact, the so called "dust proof" motors have only about one-half the efficiency per unit of weight of a properly designed open or non-dust proof motor. Mr. Thomas A. Edison has designed an invention which will permit the use of electric motors of the open type in atmospheres, however heavily they may be charged with dust, with the best efficiency at all times and with the complete exclusion of dust from all moving parts. To this end the invention consists in protecting the entire motor with a light casing formed for the most part of a porous textile material so as to act practically as a dust sieve, permitting the passage of air through its meshes but excluding dust. This casing is preferably constructed with double walls which are spaced apart and entirely enclose the motor. Furthermore, the chamber of the casing is provided with an outlet in which is placed an electric motor fan blowing air out of the chamber, such air being received through the textile walls and thereby freed from dust. In actual practice, Mr. Edison has secured excellent results with a five horse power electric motor by enclosing it in a casing four feet wide, four feet long, and six feet high on its interior, the outer wall being spaced two inches all around from the inner wall.

## Process of Converting Iron.

Frank E. Young, of Canton, Ohio, has patented an improvement in the pneumatic process of converting molten iron into malleable iron or steel. Its general objects are to oxidize the bath slowly, more perfectly, without agitation, and under complete control, and at the same time to utilize the blast for removing the slag from the surface of the metal, with a resulting elimination of all the metalloids, including sulphur and phosphorous, which renders it possible to make steel out of scrap and low-grade irons.

The process combines all the distinctive features of the Bessemer process, the hand-puddling, and the open-hearth methods, which are, briefly, the rapid elimination of the metalloids in the Bessemer, the mechanical rolling in the hand-puddling, and the period of rest or still melt in the open-hearth.

In the pneumatic processes heretofore used, whether practiced in a movable or stationary converter, the blast is injected either from the bottom, as in the Bessemer, or from the side below the surface of the metal, as in the Roberts, or just above the metal, as

in the Tropenas; but in all these methods it is projected upward from the surface of the metal to an exit at or near the top of the converter, and the slag or scoria rises to the surface, where it accumulates and shields the iron from the air above or becomes more or less mixed or combined with the iron: but in the new process the blast is projected under constant pressure directly across the entire surface of the molten metal, immediately removing therefrom all the slag or scoria as soon as it rises, setting the metal into a rolling motion by the mechanical action of the blast on its surface and holding the air in close contact with the metal in proportion to the pressure of the blast. This prevents any excessive agitation, and a perfect union of the oxygen of the air with the metalloids of the iron takes place with a less volume of blast.

## Elevator.

A safety apparatus for elevators has recently been patented by Mr. Edward H. Price, of Sioux City, Iowa. The invention relates to devices in which the elevator door cannot be opened until the elevator car or cage is opposite one of the floors of the building, and when once a door is opened, the car cannot be started until it is again closed. For this purpose a lock is employed on the shipper shaft. This lock comprises a cam secured to the shaft and having a notch in its periphery. An electromagnet is mounted contiguous to the cam and the movable armature of the same is in the form of a latch that drops into the notch of the cam when the magnet is de-energized. The coils of this magnet are in a circuit which is always open and comprises contiguous strips arranged upon one of the guide posts of the elevator, these strips being engaged by suitable brushes carried by the car and arranged to electrically connect the strips. The circuit is open except when the doors are shut, and for this purpose each door is provided with a circuit closer suitably connected with the conductors. In order, however, to prevent the doors from being opened except when the car is in line with the different floors, each door is provided with a locking device controlled by a separate circuit, and these circuits are only closed when the car is in such position that the brushes connect the same so as to permit the opening of the door. Therefore, assuming all the doors closed, the latch circuit will also be closed, the latch being thus elevated so that the shipper shaft is free to be operated and the elevator started in either direction. When any floor is reached the brush on the cage comes into proper position to close the circuit of the door, but such circuit cannot be completed until the shipper shaft is in proper position to be locked. When, therefore, the elevator car is at a stand-still opposite one of the floors of the building, the doors may be freely opened. Immediately upon such opening, the circuit through the lower magnet is broken, releasing the pawl or latch, and locking the shaft against movement. This circuit remains broken until the door is closed so that the elevator cannot be started as long as the door is open. Simultaneously with the breaking of the magnet circuit, the lock circuit is broken; but as soon as the door is again closed the circuits are re-established to start the elevator, and as soon as the car moves, the lock circuit is again broken so that all the doors are again held against being unlocked until the car is stopped opposite another floor.

## Storage Battery.

The National Battery Company, of Cleveland, Ohio, and Jersey City, New Jersey, have purchased a patent on a storage battery invented by Mr. Elmer A. Sperry, of Cleveland, Ohio. In the manufacture of such plates or elements as usually carried on heretofore, the active material or the composition of which the active material is the chief constituent, is moistened with a liquid to form a plastic mass, which can be applied to the grid and pressed thereon under high pressure. In accordance with the present invention, finally-divided metallic lead is employed as the active material, and a particular menstruum is employed for the purpose of moistening the active material to form the plastic mass, the combination of such menstruum with the metallic lead having the effect of rendering the positive plates denser, and therefore better able to withstand the disintegrating influences to which they are subjected, than the plates or elements heretofore produced. The menstruum consists of a neutral liquid, preferably distilled water, to which is added ammonium hydroxid.

The dry powdered substance which forms the body of the element, and which may by preference be a composition of metallic lead and ammonium sulfate, is thoroughly mixed with the menstruum above described, as by violently agitating the dry powder and the liquid in a suitable vessel, the plastic mass thus prepared is applied to the grid, which is then dried out under very high pressure. The element formed as above described is dense as compared with elements formed in the usual manner, and resists much more successfully the disintegrating influences to which such elements are subjected.

## Thermite.

A new heating force—lately discovered—is called thermite, and it is said to have the power of melting iron and stone instantly. Under its blaze, granite can be made to flow like water, and huge steel rails can be welded in an instant. Thermite can be made to explode with enormous power, or to work almost noiselessly.

The new force is declared by authorities to be the most startling discovery in chemistry. A touch of a match to the compound, it is said, will produce a temperature of 5,400 degrees Fahrenheit. The human mind can form no real conception of what such a temperature means. Nothing could withstand such a power. Yet this heat can not only be produced at a few moments' notice; it can be controlled—regulated for use in factories, in foundries, in machine shops, for melting, welding and shaping masses of iron and steel. It will be specially useful in producing hitherto rare and costly metals in a state of almost absolute purity.

The invention—like many others of a chemical nature—found its birthplace in Germany. Some time ago the Messrs. Krupp, the well-known gun and armor plate manufacturers, required a considerable quantity of pure metallic chromium, the metal employed to give extra hardness to steel. It is difficult to obtain this metal in a pure state, and it was once thought impossible to manufacture it on a large scale. The task of filling Krupp's order fell to a capable

chemist, who saw the necessity of inventing a process of production.

It had long been known that if a mixture of aluminum filings and oxide of chromium were heated in a furnace, a violent explosion would follow, on account of the intensity of the chemical action occasioned; but no one knew just how it happened, as the contents of the crucibles were always scattered.

The chemist argued that in such cases, metallic chromium must be found: also that the explosion was due to a too sudden heating of the furnace. He believed that if he could start the chemical reaction at one little point in the mass, it would proceed more gently and itself produce heat enough for its completion. The case was like that of a loaded railway car at rest on an incline. A little push would send it down without the aid of motive power.

During his experiments, the aluminum filings were mixed with the oxide of chromium and a teaspoonful of ordinary flashlight powder and peroxide of sodium was placed on the mass. This acted as a "primer." A match was applied. There was a flash, followed by a glow and a gentle flame. When the crucible, on cooling, was opened, metallic chromium, 90% pure, was found at the bottom, beneath a slag of aluminum oxide, or artificial corundum.

This was the first step in one of the greatest inventions of the age. The chemist soon discovered that pure manganese—also an almost unknown quantity for commercial purposes—could be made in the same manner. Then came experiments with oxide of iron, and the discovery of thermite. The inventor found that if oxide of iron (a pure hematite ore) were substituted for oxide of chromium and touched off by the flashlight primer, its action would be far more violent, though it could still be controlled.

During the trials, the slag of the corundum spurted out liquid and flame. The pure metallic iron ran like water, and sank to the bottom in molten mass, so dazzling that the operator was obliged to wear blue glasses to continue his work. As it was, he was temporarily blinded, and scorched by the intense heat.

This method of producing iron cannot, of course, compete with the blast furnace, from a commercial point of view; but, as a source of heat, it contains vast possibilities. Experiments in the welding of rails demonstrated its potentialities. The clean-cut ends to be welded are clamped together by a kind of portable vise. Around the joint to be welded is arranged the mold, composed of highly refractory material. A plugged pipe of the same material, communicating from above with the bottom of the crucible, is adjusted. In the crucible is placed a charge of thermite; on this, a small quantity of flashlight powder. The operator (armed with blue spectacles) drops a lighted match on the primer (thermite will not take fire from a match) and retires to a safe distance.

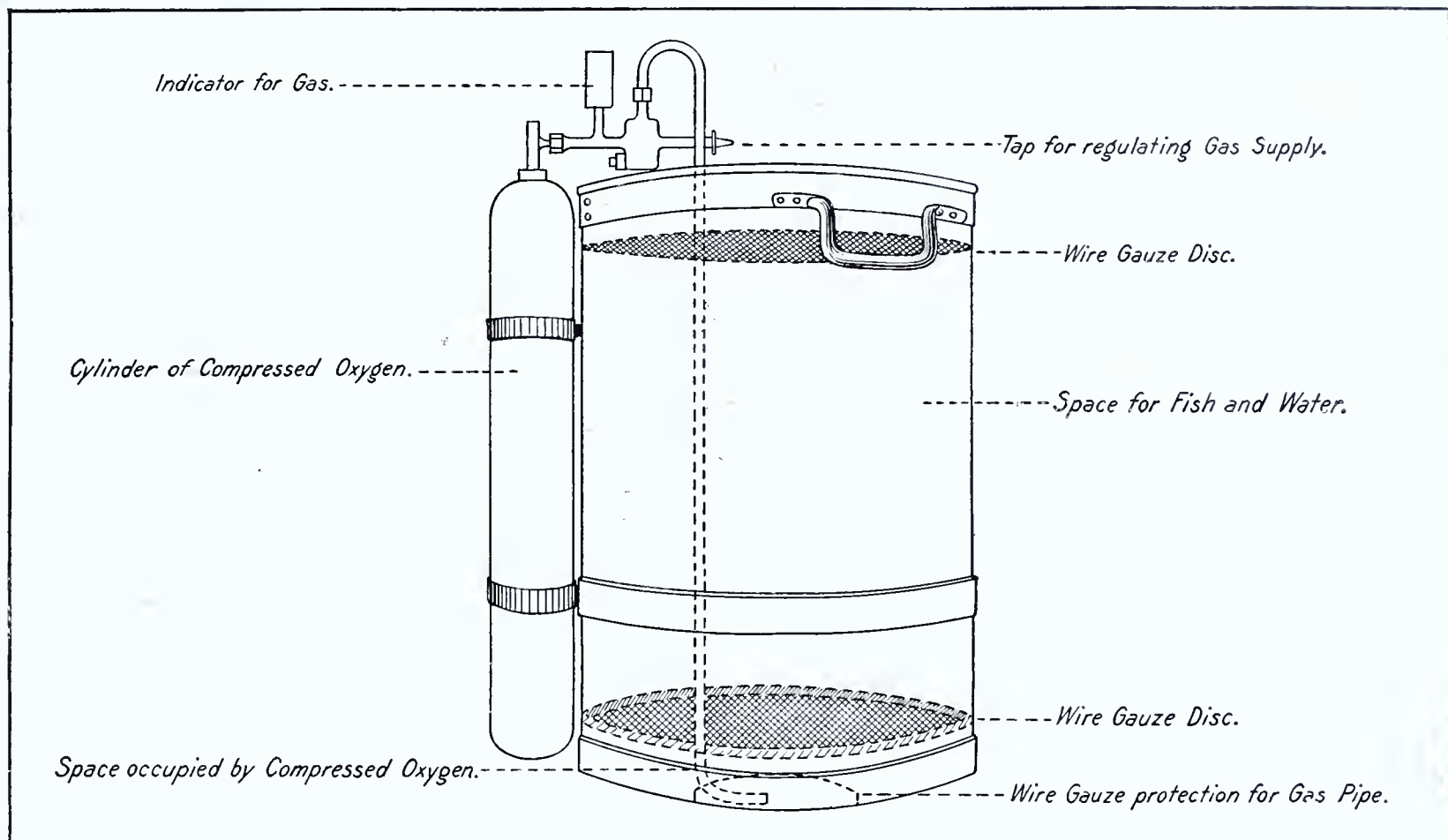
The miniature volcano explodes. The operator returns, opens the plug, and the contents of the crucible flow quickly into the mould and on the tightly clamped rails. The liquid iron sinks to the bottom and fuses the lower flange, strengthening the joint. The hot slag touches the upper part of the rail and heats it to such a degree that the union is instantaneous and perfect. Later, the mould is opened. A blow or two with a hammer separates the slag from the upper part of the rail, and this is left solid.

It may be noted that this new discovery is also capable of causing much damage, in the hands of burglars. The safe breaker needs only to touch a cigarette light to a handful of metal filings with a primer, and bank vaults and combination locks will vanish.



### DEVICE FOR CARRYING LIVE FISH.

Shippers of fish will be interested in the accompanying illustration of a device patented by Gmur, Maurer & Wiget, of Lucerne, Switzerland, for the transportation of live fish. The cylinder attached is charged with compressed oxygen, and automatically allows the required amount of gas to descend, by means of a tube, under a very fine wire gauze, which is a little above the bottom of the barrel or cask. The pressure of the oxygen keeps the water from entering the space between the screen and the bottom of the barrel, and allows only a small portion of the oxygen to penetrate at a time. The gradual escape into this space is greater than the outlet through the wire gauze, with the result that when the space becomes greatly charged with oxygen gas, and the force of the water above is no longer able to hold it, it rushes into the tank or barrel with such force that the fish are turned over and over. The most



delicate fish can be packed in these tanks in great quantities and will keep alive for thirty-six hours with the present device; but it is expected that with a larger cylinder of oxygen, the length of time will be increased. Shell fish and eels could be packed like sardines in a tin.

As the cylinder containing the compressed oxygen gas works automatically, no care is required during the transportation of the casks.

Large quantities of brook trout and other fish are being sent from Switzerland to other parts of Europe by means of this device. As an illustration of the advantages of being able to transport the fish alive, Messrs. Gmur, Maurer & Wiget state that in Vienna, for instance, they receive 80 cents per pound for live brook trout, whereas for the dead ones they only receive 30 cents. The firm has in construction several large tank cars with cylinders attached, to enable them to transport a greater quantity of live fish.

### THE OLDEST LOCOMOTIVE IN THE WORLD.

AN ENGINE BUILT BY GEORGE STEPHENSON IN 1822, AND STILL AT WORK IN 1902.

It was in 1813, while following his employment at the Killingworth Colliery in Northumberland, that George Stephenson constructed his first locomotive, which he named 'My Lord,' evidently as an expression of his appreciation of the encouragement and financial support given to him by Lord Ravensworth, one of the principal partners in the Killingworth Colliery. The engine was placed on the Killingworth Railway on July 25, 1814, and, having succeeded in drawing eight carriages weighing thirty tons up a gradient of 1 in 45.9, was acknowledged to be the most successful working locomotive which had up to that time been constructed.

Despite the complete success attending the working of the Killingworth railroad, it was not until some five years later, in 1819, that we first see Stephenson in the role of a railway engineer, as up to this period he had been employed solely as an ordinary colliery mechanic. In 1819, however, the owners of the Hetton Colliery, Durham, decided to transform their wagonway into a locomotive railroad; and recognizing the abilities of the Killingworth engine-wright, they in-

vited Stephenson to act as engineer of the undertaking, which, with the approval of the Killingworth Colliery Company, he agreed to do. The Hetton Railway was then the longest in that part of the north of England; it was eight miles in length, extending from Hetton Colliery, a few miles west of the city of Durham, to the shipping-staiths on the river Wear at Sunderland, and crossing in its course Warden Law, one of the highest hills in the district. The character of the country forbade the construction of a line with easy gradients, except by an expenditure much greater than the amount placed at Stephenson's disposal; and as heavy works could not be executed, it was necessary to make the line with but little deviation from the natural conformation of the ground, and also to adapt the mechanical methods employed for the working of the railway to the character of the gradients, which in some instances were unusually heavy. Stephenson carefully drew the line between the cases in which the locomotive could be usefully employed, and those in which stationary engines were calculated to be the more economical. Consequently on the Hetton

line we find there were employed five self-acting inclines, the full wagons drawing the empty ones up, and two inclines worked by reciprocating engines of sixty horse-power each.

The Hetton line was opened on November 18, 1822, or nearly three years before the first public railway, the Stockton and Darlington, and on that date five of Stephenson's locomotives were at work. The speed of these locomotives was about four miles an hour, each engine drawing a train of seventeen wagons, weighing about sixty-four tons.

It is of interest to observe that one of the stationary engines at Hetton, built by Stephenson in 1822 for hauling the wagons up one of the inclines, continued working until 1876, when it was withdrawn after nearly fifty-four years' service; also that one of the locomotives built by George Stephenson for the opening of the Hetton Railway in 1822 is, after nearly eighty years' continuous service, still at work at Hetton hauling the coal-trucks. This is the oldest working locomotive in the world. It cannot be expected that much of Stephenson's original work remains in the engine; but its general design, excepting the cab, &c., remains as originally constructed. This is explained by the fact that at various times different parts have been renewed, the new pieces being made to correspond with those taken

out, while some parts, notably the steam dome, are actually portions of the engine as constructed in 1822. The principal dimensions of this old-timer are: diameter of the cylinders, ten and three-quarter inches; piston stroke, twenty-four inches; diameter of the wheels, three feet. The weight of the engine is fifteen tons; and it has a haulage capacity of about one hundred and twenty tons, at an approximate speed of ten miles an hour on a fairly level track.

Now, after its long and faithful service, it is not surprising to learn that the engine is unequal to the ever-increasing demands made upon it; and the directors of the Hetton Colliery propose to withdraw it from work at Hetton. With peculiar and commendable appropriateness, the old relic will find a permanent resting-place in the Durham College of Science, Newcastle-on-Tyne, where it will be preserved for this and future generations as a worthy specimen of the earliest period of locomotive engineering. No. 1 Locomotive, now placed on a pedestal at Darlington Station, was built by George Stephenson for the opening of the Stockton and Darlington Railway in September 1825, and continued working on the first public railway until 1850. It then passed into the hands of Messrs Pease and Partners, by whom it was used for colliery purposes until 1857, when it was placed on exhibition at Darlington. Therefore, in point of date of construction, and also in the number of years of active service, the engine used at the opening of the Stockton and Darlington Railway must give place to the old engine at Hetton constructed by George Stephenson fourscore years ago.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,

WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to

THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, MAY, 1903.

### Trade-Mark Rights in Foreign Countries. An Important Decision.

The imitation of trade marks is a live question, important alike to the public, and to the parties whose interests are affected. The public is interested in obtaining just what it pays for, while the trade is desirous of protecting its own interests.

It is a common thing abroad for foreigners to appropriate bodily the marks of successful American manufacturers and exporters. Indeed, in some instances, American exporters have found that foreigners have gone so far as to register *in their own names*, trade-marks which belonged to Americans. As in some countries the first registrant obtains the legal right over everyone else, it has happened quite often that American exporters have found themselves confronted, at the threshold of some country, with their own trade-marks, which have been registered in the name of a resident of that country; thus actually preventing the American manufacturer from shipping or selling his goods with his own trade-mark affixed in the territory covered by the registrant of the mark.

Of all concerns which have had to endure the iniquities of such practices, the Apollinaris Company has probably been robbed more than any of the others. They have just spent \$20,000 in gaining an important decision from the Supreme Court of Chile in relation to the falsification or fraudulent use of trade-marks. The Secretary of the United States Legation at Santiago reports the matter in a communication to the State Department.

Although several laws have been passed by the Chilean Congress on the subject, the last being 1898, those dealing in genuine imported articles have been obliged to suffer from the fact that imitations made in Chile were on the market under false labels. By the action of the Apollinaris Company, other merchants have a precedent in

law which will make it easy for them to suppress the counterfeiting of trade-marks. Among other things, the decision holds: "That the name of a person or well-individualized industrial establishment cannot be legitimately used by other parties for the purpose of speculating with the same detrimental to the true owners, whether the latter have or have not taken the precaution to inscribe such names in the public register created by the law of November 12, 1874."

Thus, in effect, the doctrine of "unfair competition" which obtains in this country, has become, by the decision referred to, the established law of Chile.

### A Much-Needed Reform.

While the work of the Patent Office, so far as new applications is concerned, is progressing satisfactorily, and the accumulated matter is gradually being taken care of, there is one feature of the present practice which attorneys cannot look upon with any favor, and that is the practice of some Divisions of the Patent Office of giving precedence to new applications instead of amended cases. Rule 63 provides that: "Applications which have been put into condition for further action by the Examiner shall be entitled to precedence over new applications in the same class of inventions." There are, however, twenty-two Divisions of the Patent Office which are conducting their work on an entirely different basis. That is to say, instead of giving precedence to amended cases, they are actually taking up new applications ahead of amended cases. This is all wrong. When an application has once received official action by the Patent Office, it should be given precedence over new work throughout the prosecution of said application. It is just here that the great delay in the prosecution of an application comes in. It is one of the most difficult things an attorney has to explain to his client. An inventor, on examining the Official Gazette, notices that the Division having charge of his application is only a month behind with its work, and naturally supposes that as soon as a month has gone by, his patent should be allowed. Whereas, no matter how trivial an objection may be made to the application, and which necessitates an official action and an amendment, the inventor is required to wait longer to have the amendment acted on than for the first official action. There should be a different practice instituted, and the rule above quoted, which requires that an amended case should be given precedence, should be enforced.

It is a well-known fact, that where an Examiner keeps up his amended cases, it is not difficult for him to retain control of his new work, and it is believed that if an order were issued requiring all Examiners to give preference to amended applications that the difficulty of retaining control of the new applications and keeping them from falling in arrears would be largely done away with.

### Some Defects in Patent Practice.

A writer, in an exchange, comments sharply on the present system of patent litigation: and his criticisms are instructive and worth careful consideration. He says: "Under the existing system of litigation, the court never, or rarely, sees or hears the expert witnesses, and therefore cannot judge of their truthfulness or character. All expert testimony is taken before a stenographer or typewriter, who is nominally an officer of the court, but in reality has no power to enforce ordinary rules governing the taking of testimony, has no power to limit the length and cost of examinations, or to confine the witnesses to the subject-matter in issue. Consequently, the strongest—that is, the richest party—may completely exhaust its opponent by cross examination at great length, and thus in fact, tire him out." He suggests that testimony be given by qualified experts satisfactory to the court, who, instead of being the accomplices of the lawyers employing them, should in fact be court advisers—men who are capable of advising the courts as to the facts and the fundamental data at issue: and that the testimony should be given before the court and not its deputy. There is good, sound, common sense in this arraignment of the present court practice in infringement litigation: but it is not believed that it will do any good. Lawyers profit by the present conditions, and as long as that is the case, and the lawyers make the laws, there will never be any change.

It seems proper, however, to call attention to one of the abuses of interference practice, and that is the taking of testimony in cases before the United States Patent Office.

As is well known, the Patent Office exercises no control over the taking of testimony. Each side employs its own notary, pays its own witnesses, and in other ways exercises complete control over its own examination. He can make it as long and as drawn out as he pleases. He can begin the examination at ten o'clock in the morning, have one and a half hours for recess, and adjourn at half past three in the afternoon. He can instruct his client to refuse to answer any question, and the cross-examining attorney will be obliged to have recourse to the Federal courts in order to compel the party to answer the question.

The Commissioner of Patents is given authority under Section 4905 to establish rules for taking evidence and depositions required in cases pending in the Patent Office; and if this provision of the law is not of sufficient scope to justify the Patent Office assuming control over the examinations of witnesses in interference cases, it is thought that the power of Congress should be invoked to amend the law. For instance, instead of examinations being conducted before a notary public selected by the parties, the law should provide for the detailing of an official of the Patent Office to attend the examination and conduct the proceedings. In this way, valuable time would be saved, interference records reduced in size, and the proceedings

much simplified. Furthermore, in a case where the witness refuses to answer a question put on cross-examination, and the Patent Office official attending the examination decided that it was material and proper, the Patent Office could easily compel the witness to answer by simply serving notice on the party, in whose interest he was called, that unless the answer were given, the entire disposition of the witness would be stricken out. It is easy to see, that with such a penalty hanging over a party, he would see to it that his witness answered the question. As it is now, when a witness refuses to answer a question put on cross-examination, the record has to be certified to the court, and a formal motion made and argued; and weeks after the question has been put and an answer refused, the court may decide the motion, giving the witness in the meantime ample opportunity to formulate an answer, which will do his side as little injury as possible.

There are other defects in the interference practice, but the lack of control of the Patent Office over the proceedings outside the Office seems to the writer as anomalous, and one that should be corrected.

The annual report of the Smithsonian Institute for 1901 contains fifty articles, many of them illustrated, nearly all prepared by masters of the respective subjects, telling in clear and interesting language of the latest progress in all the principal branches of knowledge. The Smithsonian reports are distributed by the Institution to libraries throughout the world; may be had by purchase at cost from the Superintendent of Documents, Washington, D. C.; and may also generally be obtained, free of charge, from the applicants' member of Congress.

### Bonus System for Engineering Works.

The publishers of the "Cassier's Magazine" have just issued in pamphlet form the article on the Bonus System which appeared in their Machine Shop Number, published a few weeks ago. Of the various methods of encouraging increased production among workmen, especially in engineering works, no system has ever produced such satisfactory results as some form of a bonus system; but a bonus system without some method of imparting the necessary information both to the employer and the employee is not likely to prove workable. This pamphlet deals not only with the system, but with the method of accomplishing what that system aims to accomplish—increased production and satisfied workmen.

Price 10 cents. Published by The Cassier Magazine Co., 3 West 29th Street, New York.

In our last issue we referred to the Victoria Falls on the Zambesi, Africa. It may interest the reader to know that the available horse power of these falls is 35,000,000—a vast amount of energy which is now, and has been for untold ages, running to waste. Some day these falls will be made to churn out vast volumes of electrical energy; enough to feed a network of railways which will cover a no longer "dark" continent.

THE INVENTIVE AGE contains sound advice to Inventors and Patentees. For lack of such advice many have lost money. Subscription, One Dollar a Year.



**Artificial Marble.**

The United States Consul at Copenhagen states that, in consequence of the lack of natural marble in Denmark, many attempts have been made to produce an artificial substitute; but until recently without success. A master-builder at Copenhagen has now succeeded in producing a stone with such delicate transitions of color and play of tints that it is difficult to distinguish it from the real article. The process of manufacture is said to be simple and easily learned, and the necessary plant is very cheap. The artificial marble can be produced in the form of slabs, columns, capitals, etc. A slab of one-half inch thickness will cost about fourteen cents per square foot.

**Rusty Screws.**

According to Modern Machinery you can remove rusty screws by applying heat. A small bar or rod of iron, flat at the end, if reddened in the fire and applied for two or three minutes to the head of the rusty screw, will, as soon as it heats the screw, render its withdrawal as easy by the screw driver as if the screw had been only recently inserted.

As there is a kitchen poker in every house, that instrument, if heated at its extremity and applied for a few minutes to the head of the screw, will do the work of loosening, an ordinary screw driver will do the rest without causing the least damage, trouble or vexation of spirit. It is a good plan to grease screws before inserting them.

**Utilizing Chimney Smoke.**

In Brussels, Malines and other Belgian towns a novel method of not only getting rid of smoke, but turning it to good account, has recently been employed. The smoke is driven by a ventilating fan into a filter filled with porous material, over which a continuous stream of petroleum, benzine, alcohol or some liquid hydrocarbon flows. The result is that the smoke is entirely suppressed, while the filter yields a gas of great heating power, which can be used for domestic purposes and for driving gas engines. The filtering material itself also becomes a good combustible during the process.—*Economist*.

**The "Yankee" Screwdriver.**

In all electrical work, there are many places where it is very desirable to have a screwdriver that can be easily operated by one hand. Such a device is now on the market bearing the name of the "Yankee" ratchet screwdriver. It is made in 2, 3, 4 and 5 inch lengths, all sizes having a blade 7-32 inch in diameter. The great convenience of this driver is that in starting a small screw, the hand may hold the driver firmly in the slot of the screw and prevent it from wobbling, while with the first finger and thumb, using the small knurled washer on the blade, the screw can be well started and then driven home with the hand on a rigid driver. By sliding the little catch to the opposite end of the slot the ratchet is reversed, and after starting the screw, it may be run out by means of the finger and thumb as described above. It is made by North Bros., 321 Lehigh Ave., Philadelphia, Pa.

**Prevention of Malaria.**

Complete protection from malaria may be ensured by any individual who is willing to take the trouble to pay scrupulous attention to the use of a good mosquito curtain at night, and to adequately protect himself from being bitten by mosquitoes during the evening hours. If these simple precautions are taken it is quite unnecessary to use quinine as a prophylactic. By the use of the same precautions also, and without taking any quinine, travelers have passed two years in the most malarious ports of Africa without a single attack of malaria. When such success attends the adoption of simple measures of defence against malarial mosquitoes, there is good reason for hoping that additional preventive measures, such as the destruction of the breeding grounds of anopheles, will do much to eliminate a disease, the death tribute to which has been already far too costly.—CAPTAIN S. P. JAMES.

**The Oxygenator.**

This is an apparatus for the easy production of oxygen gas for medical purposes, metallurgists, users of the limelight, and others. It has the merit of being portable and safe. In action the apparatus may be compared to a generator of acetylene gas, where calcium carbide is brought into contact with water. In the oxygenator, oxyolith, which is a preparation of sodium peroxide in the form of solid cakes, is brought into contact with water, with the result that an abundance of pure oxygen is evolved, which only requires filtration through cottonwool to rob it of its moisture before it is ready for use. For years past compressed oxygen has been supplied in steel cylinders, and for large users of the gas no better system can be devised; but where only small quantities are wanted and the demand is intermittent, the oxygenator possesses advantages. Its use would also be profitable in places where communication with the oxygen works is difficult.

**An Electric Pyrometer.**

A method has been recently described of gauging the heat of a furnace by comparing the light given by it with the light afforded by a small electric glow-lamp. The latter is mounted inside a tube which points towards the furnace, and by means of a lens the condition of the filament is easily seen. When the lamp is cold—that is, when no current is passing—the filament is seen as a black thread upon the glowing mass of incandescent fuel beyond; but when the current is switched on it becomes invisible after a certain point of incandescence is attained. If more current be applied the filament will be seen to be brighter than the glow from the furnace, and is therefore apparent as a bright thread as compared with the darker glow of the furnace. The strength of current necessary to bring about these changes can be read upon a scale attached, and the furnace temperature can be deduced therefrom. The readings, however, are limited to a temperature between three and four thousand degrees Fahrenheit.

**Ventilation.**

Dr. T. Glover Lyon has recently issued a pamphlet entitled "Ventilation for Crowded Places." The method may be thus described: Air, warmed by electric radiators or by hot water pipes, is forced into the room to be ventilated by means of a fan; but instead of entering the apartment directly, which would give rise to draughts, the air is let in through perforated screens, the apertures of which are so arranged that where the pressure is greatest the openings are contracted. By the adoption of this device, the air is evenly distributed throughout the room. At the other side of the apartment the vitiated air is drawn out by means of exhaust fans, so that there is a continual circulation and constant change of atmosphere. The system is eminently adaptable for the use of hospital wards, where it is the practice to allot a certain number of cubic feet to each patient. It is obvious that if in such institutions an efficient system of ventilation were installed, the number of patients could be trebled, or even quadrupled to the very great benefit of suffering humanity.

**Furnace Gas Engines.**

The construction of gas engines to burn the gases of blast-furnaces probably represents even more important economical changes than those for utilizing either natural gas or producer and illuminating gas. Germany has held undisputed supremacy in the development of this form of engine in the past few years, and we are just beginning to profit by her experiments. Engineers look to the German operators for their designs and tests with the blast-furnace gas engines, but now that they are perfected, it will not be long before a complete change will be effected in this country. With our numerous blast-furnaces scattered all through the country, it is essential that the installation of engines to utilize the waste gas should be made at once. The gas engine of 1,000 horse power is no longer a dream. It has been steadily developed and improved by the tandem system, so that it can be operated by blast furnace gas of but 27 calories per cubic foot. As a result of this development, the blast furnace suddenly assumes an entirely new line of development. It may be that the production of pig-iron will, in the near future, become only of secondary consideration, and the gas for operating engines the chief factor of the works. The blast-furnace gases are sufficient to run powerful engines, even when discounting half for waste and for heating the air-blast of the furnace.

The amount of gas generated by a blast-furnace to produce pig iron is so enormous that if collected and utilized for power purposes it would prove revolutionizing in manufacturing industries. Thus to produce in an ordinary well-equipped works about 50 tons of pig iron, the blast-furnace would generate upward of 20,000,000 cubic feet of gas. To harness this enormous amount of waste fuel is the aim of the builders of gas engines. Utilized for generating steam by burning, about 1,000 horse power could be obtained;

but if burnt directly in a modern large gas engine, the horse power generated would be several times as much. Eminent engineers estimated that even if half this volume should be wasted or used for heating the air blast of the furnace, there would still be sufficient to produce between 3,000 or 4,000 horse power. Such an enormous gas generator would thus prove of the greatest value for ordinary manufacturing purposes. Likewise, the gases of coke ovens can be utilized in the same way, adding greatly to the importance of the gas engine in its new field.—*Iron Age*.

**Magnets for Lifting Heavy Weights.**

The availability of magnets as lifting devices has been known, experimentally and practically, for many years. Some of the oldest treatises on electricity and magnetism give the lifting power of magnets as that weight which the armature of the magnet will sustain without falling off, and it was a common, but, to the audience always wonderful, feature of the quasi-scientific lectures that were more in evidence half a century ago than they are today, to suspend heavy rails, bolts and various other articles, from the poles of magnets. These were permanent or natural magnets, usually of the horse-shoe type. With the advent of electromagnetism more pretentious experiments were devised, amongst others that of winding a cannon with insulated wire and sending an electric current through the wire, whereupon a cannon-ball would be drawn into instead of shot out of the cannon's mouth. One of the practical uses of a magnet, but to those immediately concerned a highly important use, is that in which it is sometimes employed to withdraw small pieces of iron from such out-of-the-way places as the human eye. Another use of the tractive force of magnetism on a much larger scale was that to which it was put by Edison in his magnetic ore separator, in which the ore, previously crushed to a fine powder, is dropped down a chute past the poles of powerful electro-magnets, in passing which the iron particles of the ore are deflected to one side while the non-magnetic stone dust continues undeflected down the chute. Still another instance of the employment of magnetism in a small way is that in which a magnetised tack hammer is used in the manufacture of strawberry baskets on a large scale in conjunction with a mechanical device which presents the tacks, one at a time and head up, to the operative, thereby greatly facilitating his work.

It is a far cry from lifting a tack by means of magnetism to the lifting of massive iron and steel plates weighing four, six and twelve tons by this same force, which is now done every work day in a number of large steel works. Electro-magnetism, of course, is utilized, the form of the magnet being usually rectangular for this work and presenting a flat surface to the plates lifted. The magnets are suspended by chains from cranes, and pick up the plates by simple contact and without the loss of time consequent to the adjustment of chain and hooks in the older method. It is also found that the metal plates can be lifted by the magnets while still so hot that it would be impossible for the men to handle them. The ratio of weight of these magnets to the weight lifted varies with the machine; in some cases this ratio is 30. Thus, a magnet weighing 300 pounds will lift 4.5 tons. The magnet is operated by current from a dynamo, controlled by switches and rheostats, and one of the capacity mentioned requires about four amperes at 250 volts, or 1.34 horse-power. These magnets also have the advantage for this class of work that a number of them can be applied jointly to lift a heavier weight than one machine could lift singly.—*Cassier's Magazine*.



## The Making of Diamonds.

IT has been the custom to describe anything of unusual excellence as being 'worth its weight in gold.' It would give far greater force to such an estimate if for gold we were to say diamonds: for a diamond of even moderate size is worth many thousand times its weight in the precious metal. A gem which was exhibited not long ago in London, one of the finest ever yielded by prolific Kimberley, was valued by experts at two hundred thousand pounds, a sum which in gold would weigh just about two tons. The value of the gem becomes more strikingly apparent when we reflect that it weighed little more than an ounce, and could easily be hidden in a corner of the waistcoat-pocket, while its equivalent in gold would require for its portage a trolley and a couple of strong horses.

Pliny, in his *Natural History*, speaks of the diamond as being the most valuable thing on earth, and as being of such indomitable hardness that if placed on an anvil and struck with a hammer the gem will remain uninjured, whilst the anvil and hammer will be split to pieces. Pliny also asserts that the diamond is incapable of being burnt. The world would have been richer in diamonds to-day had Pliny and his disciples been a little more particular in verifying their statements: for long after his time it became the custom to test the genuineness of a diamond by the hammer, and many valuable gems were thus reduced to fragments. A diamond is certainly very hard, but it is also brittle; and evidently Pliny and his followers could not distinguish between these two entirely different properties. Nor is the old philosopher more accurate when he speaks of the diamond being incombustible; for, as we shall presently see, it quickly yields to the action of fire. Many fine gems in past times have been destroyed in the attempt to show that they would stand the ordeal of fire, and many of the smaller size have been sacrificed in the chemist's laboratory in the endeavor to discover the nature of the beautiful gem-stone.

It is now known to every one that the lustrous diamond is simply carbon in transparent crystalline form; and it is by no means difficult to put the matter to the test of direct experiment if we are content to sacrifice a small gem in the operation. A glass flask is filled with oxygen, except for an ounce or two of clear lime-water, which is allowed to remain at the bottom of the vessel. The diamond to be tested is held in a tiny cage of platinum-wire which is attached to two thicker wires that extend through the cork of the flask and are connected outside it with an electric battery. Directly the circuit is completed the diamond bursts into flame and ultimately disappears, while the lime-water becomes milky through the action of the carbonic acid formed by the union of the carbon and the oxygen. Precisely the same effect is produced if for the

diamond we substitute a piece of charcoal or other form of carbon. In this way the chemist is able to assert most positively that the valuable diamond is identical in composition with one of the commonest elements known. The glittering stone which has been always identified with all that is princely and magnificent has, after all, only a very humble parentage. Its brother is the piece of coal that tumbles unheeded out of the fire-grate on to the hearth. The possibility of reversing the experiment which has just been described, by taking the charcoal and turning it into the crystalline form, has naturally occurred to many minds; but it is a problem by no means easy to solve. However, as we shall presently see, the task is by no means an impossible one.

The beauty and great value of diamonds have from the earliest times fired the imagination of writers. Sinbad the Sailor found himself in a valley where these gems strewed the earth instead of ordinary pebbles; and it will be remembered that Aladdin was conducted by his pseudo-uncle, the wicked magician, to a subterranean garden where the petals of the flowers were formed of brilliants. The chemist is the magician of to-day, and to his laboratory must we look for the production of diamonds, if they can be produced artificially.

The manufacture of imitation gem-stones was long ago carried to great perfection, and there are shops in most large cities where these are artfully displayed near hidden electric lights so as to make a brave show. Any gem can be well imitated in what is known as 'strass,' which is a peculiar kind of glass of high reflective power. Imitation gems are also made of the different varieties of quartz; but the best of these fall very far short of the beauty of the diamond: and there are simple tests which at once reveal their true nature. Those who are hoping to reproduce in the laboratory the true diamond have no thought of these acknowledged imitations: they aim at making artificially a veritable diamond which is identical with the natural product in hardness, in specific gravity, and in resisting the action of acids.

We have seen how the chemist is able to analyze a substance. Wonderful is it to reflect that he can take a thing of complex composition and can tell us not only what are its constituents, but can give us the proportion of each one of them. Still more wonderful does it seem that he can in many cases build up those constituents so as to form a natural product artificially. To give only two instances of the chemist's power in this direction, we may name madder and indigo, the production of which in the laboratory has had the effect of revolutionizing two important industries. It would seem a comparatively easy matter to induce charcoal to assume the crystalline form, and thus to make diamonds: but Dame Nature does not

reveal her secrets too easily. Those who would win her confidence must study her methods and work hard, and even then she is most grudging of her benevolence.

About twenty years ago much excitement was aroused, by the report that Mr. J. B. Hannay, of Glasgow, had actually succeeded in making diamonds. Acting on the belief, which is general among chemists, that these gems are formed in Nature's laboratory by the joint action of great heat and immense pressure, he enclosed carbonaceous substances in a strong wrought-iron tube, which was closed at both ends, and submitted it for hours to the fierce heat of a reverberatory furnace. In many cases the tube burst under the ordeal; but occasionally one was found to withstand the treatment, and it was subsequently cooled and sawn asunder. Within it was found a dark mass of hard carbon, together with some tiny crystals which were said to be diamonds; but they were quite useless from the jeweller's point of view, so microscopic were they in dimension. Even if they had been big enough for use as gems, the cost of their production would have been far beyond their actual value. The report that diamonds had been thus manufactured doubtless caused some uneasiness among the dealers and owners of gems; but when it was found that the artificial gems had no commercial value, the scare was forgotten. Nothing has since been heard of Mr. Hannay's experiments.

The Glasgow experimentalist was handicapped in his efforts to produce the diamond by being unacquainted with the nature of its matrix or mother-rock. This is now believed to be the blue ground in which it is found at the South African mines, to which rock the name 'kimberlite' has been given. In the surrounding rocks a black shale (a form of carbon) is found: and it is noteworthy that pieces of this shale, which have been altered by heat, are found in the blue ground or kimberlite. It would thus seem to be possible, to some extent, to trace the conversion of the carbon of the shale into the crystalline form, the process having probably occurred deep down in the earth under high temperature and great pressure: for the huge pockets or 'pipes' in which the blue diamond-studded ground is found are the vents of extinct volcanoes.

The next one to take up the task of experiment with carbon with a view to produce diamonds was M. Moissan, the French chemist, who is celebrated among other achievements for his success in isolating the element fluorine. He, too, determined to try the effect of intense heat and high pressure, his method of procedure being as novel as it was ingenious. Carbon, unlike easily crystallizable bodies, is insoluble in all ordinary solvents; but, as is well known, molten metals will combine with it. Bessemer steel, for example, is made by decarbonizing iron and then adding to it a measured quantity of carbon. M. Moissan used iron as solvent for charcoal, melting the iron in the electric furnace and allowing it to take up as much of the carbon as it

could—in other words, to saturate itself with carbon. The crucible in which the white-hot metal was contained was then plunged into a bath of molten lead, with the result that globules of the iron rose to the surface of the lead and were quickly cooled on their outer surface. Inside the hard crust the iron remained for sometime in a molten condition: and, as iron expands on solidifying, the contents of those little globules were subjected to a pressure possibly not attainable by any other means. In due time the lead solidified, and bound up in its mass were several of these bullets of iron, the interior condition of which it became desirable to examine. By the action of powerful acids, first the lead and then the enclosed iron globules were dissolved, leaving a residue of carbonaceous matter which contained tiny crystals. These crystals were determined by careful tests to be true diamonds; but as the largest of them measured less than one-fiftieth of an inch in diameter, they cannot be said to have any commercial value.

It may be mentioned here that true rubies, sapphires, and some of the other gem-stones so highly valued as jewels, have also been produced in the chemist's laboratory, and that such stones, although not large enough to be set in finger-rings, are much used for watch movements.

From the scientific standpoint the chemist is content to have mastered a very difficult undertaking. It is a great triumph for him to actually reproduce these wondrous flowers of the mineral world. As to the mere size of the crystals, that does not trouble him; he is content to know that they are true to nature. There are thousands of persons in this world interested in keeping up the market price of diamonds who are most fervently hoping that the chemist will continue to regard his successful efforts in the making of gem-stones from the same academic point of view.

### Magnet Draws Steel From an Eye.

A man, as the result of a machinery explosion, was struck in the eye by a flying fragment of steel. It perforated the cornea, iris and lens, and entered the vitreous body, which became filled with blood. Three hours after the accident, when Dr. C. S. Bull first saw the patient, it was decided to make an attempt to extract the foreign body by means of the great Haab magnet. At a distance of one and three-quarter inches, the action of the magnet produced such a violent disturbance within the eye that it seemed as though the latter would be pulled from its socket. This left no doubt as to the location and nature of the foreign body. The wound in the cornea was thereupon enlarged, and when the eye was then brought into almost actual contact with the magnet, a piece of steel about four millimeters long and about three and one-half millimeters wide, was drawn out through the original hole in the lens, iris and cornea, and became adherent to the pole of the magnet. An ophthalmoscopic examination made subsequent to the removal of the foreign body showed a hemorrhage of the vitreous. After a period of ten days' treatment, the patient was discharged from the infirmary with the hole in the cornea and iris partially closed, and his vision was about two-thirds normal. There was no further cloudiness of the lens, in spite of its having been perforated.—*New York Medical Record.*



## THE UTILIZATION OF WASTES AND BY-PRODUCTS IN MANUFACTURES.

WITH SPECIAL REFERENCE TO THE DECADE OF 1890-1900.

By HENRY G. KITTREDGE, of the Census Bureau.

### PART IX.

#### THE LEATHER INDUSTRY.

In the making of leather very little is allowed to go to waste. In 1896 a patent (No. 13,096) was granted in England for making leather-board material, suitable for being pressed into form for decorative and other purposes, or for use in substitution for leather floor cloth and the like, the waste of leather alone being used. Waste fibrous material and the wax, oil, albuminous and extractive matter derived from cottonseed and shell are made into a pulp, boiled together with silicate of soda, and the whole precipitated by the addition of milk of lime. The alkaline liquor is then drained off from the precipitate. Waste leather or other animal substance is separately treated with sulphurous acid, and then added and thoroughly mixed with the first-obtained pulp, together with tanning agents or chromium compounds. The mass is then made into boards, or pressed or molded as desired.

Among the side products of the tanning of leather may be mentioned the following: Spent tan and tan liquors; waste liquors containing lime salts; scrap and skin for glue manufacture; hair, sold for cheap blanket and cloth manufacture, or for use with lime in plaster; scrap for glue manufacture, and refuse washings. These side products are obtained in the conversion of softened hides into finished sole-leather sides.

Degras, which has been referred to in connection with the woolen industry as being obtained from wool grease, is also a by-product of great value in the leather industry, and a great demand for this material for currying purposes has led to the manufacture of it as a special industry. In this process the skins are treated exactly as in the manufacture of chamois leather, being used repeatedly until no longer capable of taking up the oil. The supply from this source is not sufficient for the demand, hence an artificial degreas is sometimes made from oleic acid, fat, and a little lime soap to which some tannic acid has been added.

Scraps of leather are now converted by means of a special apparatus into boot and shoe heels, as well as other things, such as inner soles, etc. Some of the small bits of leather are utilized for what is called "shoddy leather," which is made by reducing the bits to a pulp by grinding, and by maceration and conversion into solid "sides" of leather by pressure. This is used to a considerable extent as inner soles for shoes and boots. If leather scraps

can not be used for any better purpose, they are utilized in the manufacture of glue.

#### THE DYEING INDUSTRY.

There are many by-products used in the dyehouse and in the dyeing industry which have contributed largely to the great progress that has been made in manufacturing within the last one or two decades. Of these by-products the most conspicuous and valuable are those obtained from coal tar or gas tar, which, not many years ago, was a waste material difficult to get rid of. It could not be thrown into streams because of its polluting the waters, nor could it be disposed of by burial because of its destructive effect upon vegetation, and had to be disposed of by burning.

These by-products have now become of the highest value, not only for the production of exquisite dyes, but for medicines and disinfectants, and for the production of a saccharine substance several hundred times sweeter than sugar. The list of uses to which these materials can now be converted is a long one. Naphthalene, one of the products of gas tar that was formerly a troublesome waste, choking gas pipes and otherwise making itself obnoxious, is now one of the most valuable substances for the preparation of dyestuffs. The manufacture of alizarin, an artificial preparation of the by-products of tar, has destroyed the madder industry of Europe, or practically so. The aniline by-products of gas tar is a most productive source of coloring matter, its derivatives being almost without number, and producing every shade of color imaginable. By means of a synthetic process, certain constituents of coal tar can be combined for the production of artificial indigo equal in all respects to natural indigo, at a cost that makes it an article of much commercial value. Naphtha is a well-known product of coal tar used in dissolving gums, resinous substances, etc., india rubber and gutta-percha, and for many other purposes. Perhaps the most important products of this tar are benzol, from which aniline colors are obtained, naphthalene, and anthracene, from which alizarin and purpurin are obtained.

The primary object of the coal-tar color industry has been to supplant dyewood extracts by artificial products. The manufacture of synthetic indigo is perhaps the highest attainment yet reached in this line, one involving great scientific research of immense commercial and industrial importance to textile manufacturing. It is thought by chemists that the greatest promise of ultimate success in supplanting dyewoods lies in the development of the azo-dyes as completely as artificial alizarin has supplanted madder. For most pur-

poses, more especially for the dyeing of cotton, the dyewoods may already be dispensed with, since artificial substitutes give superior results and are more easy of application.

Where dyewoods are used, large quantities of them remain after the coloring matter has been extracted and are thrown away as useless, though this is not carried on to so large an extent now as was formerly the case. In France and in some other of the European countries, this apparently useless product is mixed with tar refuse and formed into compressed cakes for fuel. It is said that a large factory at Havre made at one time such utilization of their spent dyewoods. This firm produced about 120 tons of agglomerated wood per month. The product was distinguished by the relatively small quantity of coal tar (25 to 30 per cent) which they used, as well as by the low price at which they were able to sell it as compared with other artificial wood fuel. They produced also pyrolignite of iron and wood acids, but afterwards gave into other hands the utilization of the waste residues of their manufacture, as it tended to interfere with their principal product.

Before 1870, after concentrating the coloring matter from the dyewoods, less than a dollar per ton could be obtained for the exhausted wood as a combustible, and in most cases it was thrown away as an absolute waste, so far as any use could be made of it for industrial purposes. The rational application of applied science turned this waste into a useful product. M. Chaudet, an ingenious chemist at Rouen, began to utilize this waste in a practical way, and obtained from the exhausted dyewoods various products of a commercial value. One of the most important was a paper pulp obtained by separating the incrusting substances. These, in their turn, combining with the chemical agents by which they were extracted, furnished a useful soda soap adapted to use in cotton printing. It is stated that some of the residual deposits, resulting from the exhausted campeachy and fustic woods, can be utilized in steam boilers for preventing calcareous deposits. The researches of Chaudet led him to discover that the wood of the chestnut and the beach yielded almost colorless mordants, preferable in many respects to those obtained from the ordinary dyewoods. It is claimed that the spent bark of tanneries submitted to a hydraulic press might be employed with equal advantages as an economical fuel and the derivatives made by distillation usefully applied.

The waste liquors in indigo dyeing are capable of being saved and reused. It is reported that at the works of the Pincroft Dyeing and Printing Company, Adlington, Lancashire, England, the waste liquors containing indigo in suspension are passed into precipitation tanks, receiving on the way between 10 and 15 grains of lime per gallon. The precipitated indigo is raised by an ejector from the bottom of the tanks and blown into the different vats to be used again.

During the fiscal year ending June 30, 1900, there were imported and en-

tered for consumption in the United States coal-tar colors and dyes to the value of \$4,792,103.09, upon which duties were paid to the amount of \$1,437,630.93.

The production of ammonia from animal matter is insufficient to meet the wants of the present day. Fortunately the deficiency of the supply from this source is met by an inexhaustible supply from the vegetable world, or from the plant life of former periods. In the bituminous coal fields and in the deposits of brown coal is stored up an unlimited supply of nitrogen capable of being converted into ammonia, which is now obtained incidentally in the production of illuminating gas, of coke, and of animal charcoal, the supply depending upon the extent of these industries. This is likely to prove something of an industrial embarrassment, as the consumption of ammonia has grown enormously during the last thirty-five or forty years, while on the other hand the manufacture of illuminating gas, upon which the main portion of the supply of ammonia depends, has been seriously affected by the introduction of electricity for illumination, and is likely to be further affected.

Coke production combined with the saving of the by-products is an established industry in Europe, and is increasing in the United States. The question, Will it pay to gain the by-products of the manufacture of coke? is no longer pertinent. The answer to this question has been practically solved in the affirmative. Coke production is the basis of the tar-color industry, and will further the growth of the soda industry based on the ammonia process. But it is not advocated that the production of coke should be only for the gain of ammonia; the higher yield of coke, the recovery of the tar, with the daily increasing demand for the same, and the gain of the ammoniacal water are the inducements held out by the new methods of production.

A new and interesting development in the chemical industry of the United States is the utilization of the sulphureted hydrogen gas developed as a by-product in the refining of asphaltum at the California Asphaltum Company's works at Ventura, Cal. The gas is burned to sulphurous anhydride in the usual manner, and the product of the combustion conveyed to the lead chambers. Owing to the method of its production, the gas is of a high degree of purity, and the acid produced is also of a high grade. At present the output amounts to 10 tons per day when the works are running at their full capacity. Sulphuric acid is made on a large scale at one other plant, while the manufacture of bluestone and boracic acid, carbonic acid, epsom salts, magnesia, and numerous other products is now carried on. The state of California has great natural resources upon which to base an important chemical industry, and its geographical position gives it an advantage in supplying certain markets of the Pacific slope, so it is probable that such an industry will grow up there when the transportation problem is settled.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address  
THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued April 7, 1903.

### MECHANICAL PATENTS.

- Agricultural purposes. Motor tractor for..... D. Albone  
Air and gas engine..... J. B. O'Donnell  
Aluminate and aluminate containing material. Durable elastic..... A. V. H. F. C. Clauson-Kaas  
Alloys. Producing..... W. C. Tilden  
Amusement apparatus..... C. R. Culver  
Amusement device..... H. Symonds  
Animal trap..... A. W. Phillips  
Annealing apparatus. Gold..... C. F. Dwight  
Auger section coupling. Well..... D. G. Jones  
Automobile gearing..... G. P. Dorris  
Baling press..... L. S. Gehman  
Ball catcher..... S. A. Cohen  
Ball players. Head harness for foot..... J. W. Curtiss  
Band cutter and feeder..... 2 pats. R. Shedenhelm  
Banjo..... W. B. Farmer  
Bath tub. Portable steam..... A. Moorefield  
Battery box or other receptacle..... L. Paget  
Bean preserving device..... R. R. Maxson  
Bearing. Ball..... E. J. Farr  
Bearing. Shaft..... W. L. Webster  
Beating engines. Emptying..... E. A. Jones  
Beer, &c. Apparatus for cooling..... C. Spindler  
Belt adjuster..... F. J. Fischer  
Belt. Conveyer..... R. H. Martin  
Beuch..... M. D. Jones  
Bicycle chain tightening device..... A. G. Anderson  
Bicycle pump..... S. A. Broste  
Bicycle seat support..... C. J. Trumburg  
Bicycle spring frame..... J. Hunter  
Binder..... H. P. Jones  
Binder. Loose leaf..... J. L. McMillan  
Binder. Temporary..... G. H. Gresham  
Binders. Summarizing sheet for serial..... A. O. & E. R. Kittredge  
Blowing engine or compressor..... E. Wiki  
Boiler brace..... J. P. Bauer  
Boiler furnace. Vertical..... J. MacCormack  
Boiler tube stopper..... H. T. Mason  
Boilers, &c. Pressure gage for steam..... F. Mitchell  
Bolster..... J. C. Wands  
Bolster spring..... A. Burall  
Book cloth, leather cloth, &c. Manufacture of..... J. A. Sackville  
Book. Duplicate order..... M. L. Davidson  
Boot or shoe..... J. E. Randall  
Boring or drilling angular holes. Apparatus for..... R. Bartholomew  
Bottle..... J. M. Culp  
Bottle..... C. W. Hayes  
Bottle and stopper therefor..... H. R. Bell  
Bottle closure..... L. S. & C. H. Bartlett  
Bottle. Non-refillable..... E. C. Shilling  
Bottle. Non-refillable..... J. B. Conger  
Bottle or other closures. Cap or cover for..... J. F. J. Gunning  
Bottle stopper..... H. S. Brewington  
Bottles after having been washed. Conveying and draining device for..... A. A. Pindstoffe  
Bottles previous to cleaning and rinsing. Machine for soaking..... A. A. Pindstoffe  
Breach mechanism..... J. F. Meigs  
Bridle bit attachment..... J. P. Bowmaker  
Briquetting machine..... W. A. Koneman  
Briquetting machine..... A. Johnson et al  
Brush holder. Electric..... N. A. Christensen  
Buckle..... 2 pats. H. Kerngood  
Buggy storm curtain..... B. S. D. Martin  
Burner..... N. Shaeffer  
Button. Snapping..... E. D. Conklin  
Buttons. Forming wire into collar or sleeve..... E. P. Linch  
Buttonhole finishing machine..... F. L. Harmon  
Cabinet..... W. G. Hullhorst  
Cabinet. Clothes..... R. Weir  
Cabinet. Hot meal portable..... H. H. Cooke  
Calipers..... A. G. Spaulding  
Call service. Restaurant..... R. W. Jennings  
Cane, &c., in the field. Machine for cutting sugar..... H. W. Schmidt  
Canopy and supporting frame. Combined..... I. E. Palmer  
Car brake. Combined rail and wheel..... C. V. Rote  
Car coupling..... W. S. Jones  
Car door attachment..... E. A. Hill  
Car door. Box..... F. J. Hanrahan  
Car fender..... J. J. White  
Car fender. Street..... J. J. Rawles  
Car for railway trains. Safety or buffer..... C. Noever  
Car motor ventilator..... H. B. Rowland  
Car operated automatic tramway switch mechanism..... F. Davison  
Car safety guard. Street..... C. A. Willard  
Car seat..... C. K. Pickels  
Cars. Automatic coupling for steam, air or other pipes of railway..... F. F. Lipps  
Cars, &c. Folding step for..... G. F. Stansbury  
Cars. Ventilating device for electric motors for..... H. B. Rowland  
Cars. Ventilator for electric motors for..... H. B. Rowland  
Carbonator..... E. E. Murphy  
Card punching machine. Piano J. B. Davidson  
Carpentry joint..... G. B. Lee  
Carpet cleaner..... 2 pats. G. A. Cowgill  
Carpet or rug edge holder..... J. L. Kingston  
Carver fork and guard..... E. C. Martin  
Carving machine..... E. Thern  
Casing perforator..... P. H. Mack  
Cash register..... E. S. Smith et al  
Cathode..... C. J. Henry  
Ceilings, roofs, &c. Construction of..... J. Kulhanek  
Cement lined pipe..... J. T. Langford  
Centering tool..... S. G. Twambley  
Centrifugal extractor..... R. F. Moore  
Centripetal trap..... A. J. Greenaway  
Chain making machine..... L. Bruckmann  
Chair back adjustable support..... J. Luppino  
Charcoal and conserving the vaporous distillates thereof. Making..... F. W. Newberger  
Checkrein hook for gig saddles..... C. Stack  
Chuck..... H. F. Neumeyer  
Chuck. Drill..... H. M. Reynolds  
Churn..... M. Kelley  
Churn..... G. Geer  
Cigar protector..... R. G. Fraser  
Cipher code system..... S. T. Beveridge  
Circuit breaker..... S. T. Hutton  
Claw bar..... C. W. & C. H. Threlkeld  
Clevis..... R. Wolf  
Clock..... E. Fitch  
Clock striking mechanism..... A. C. Schuman  
Cloth cutting machine. Electrical..... P. Howe  
Clothes line prop attachment..... F. G. Kimman  
Clothes rack for furniture..... L. Jones  
Clutch. Friction..... A. Soderling  
Coffins. Device for the preservation of..... O. R. Hahn  
Coloring relief or raised ornamentations on fabrics. Apparatus for..... J. Bennett  
Column..... F. P. Angell  
Column construction..... A. G. Perkins  
Combination lock..... J. & C. Arner  
Compasses or dividers..... C. E. Hand  
Composition of matter..... E. H. Amet  
Concrete building construction..... F. W. Garrettson  
Concrete buildings and nail-plug therefor. Construction of..... F. W. Garrettson  
Concrete column mold..... W. A. Staples  
Condenser..... 2 pats. R. D. Tomlinson  
Condenser. Surface..... R. D. Tomlinson  
Conveyer..... H. E. Brett  
Copy holder..... F. S. Towle  
Copying press..... L. Bailey  
Cord ball bearing holder..... R. A. Moore, Jr.  
Corn shocker..... J. M. Shively  
Cotton compress..... J. K. Cochran  
Countersink..... J. M. Taylor  
Cover lock. Vessel..... R. O. Bingham  
Cracker or biscuit machine..... F. M. Peters  
Crate. Bottle..... 2 pats. W. E. Brown  
Crayon holder..... S. H. Decker  
Crayons, &c. Holder for..... V. Johnson  
Cream separator..... J. W. Whitlock  
Crystallization..... C. Hitzl  
Cupboard and refrigerator. Combined..... A. C. Campbell  
Curtain pole and hanger..... H. P. Roberts  
Cut out switch for electric lighting, &c..... G. W. Nistie  
Cutter head. Expansion..... E. S. Shimer  
Cutting and stamping apparatus..... W. M. Rockstroh  
Darning machine..... F. Belanger  
Dental appliance..... S. E. Fish  
Derrick hoist..... J. M. Cornell  
Desk frame and attachment therefor. School..... J. C. Gilson et al  
Detector bar clip..... J. P. Coleman  
Diamond splitting machine..... A. J. Benjamins  
Dish washing machine..... L. E. Beardemph  
Display or exhibiting box..... D. F. Ferguson  
Dividers..... J. V. Steenbergen  
Doll..... G. D. Decker  
Door check..... W. M. Teeter  
Door. Grain..... V. F. W. Berford  
Door. Rotating storm..... 3 pats. J. L. Carter  
Door securer..... A. Fleeger  
Dovetailing machine..... J. T. T. Grim  
Draft equalizer..... P. J. Girard  
Dredge. Hydraulic..... J. W. Reno  
Dredges. Self contained back geared headstall for elevator bucket..... G. L. Holmes  
Dredging machine..... J. W. Humphreys  
Drop light. Portable..... L. A. Rockwell et al  
Duplex furnace..... J. B. Conger  
Dye and making same. Blue..... R. Bohm  
Dye and making same. Red azo..... C. Schirmacher  
Dye and making same. Violet azo A. L. Laska  
Dyeing with sulfur dyes..... E. Voetter  
Dyestuff and making same. Red to violet..... A. L. Laska  
Electric accumulator..... A. Schmidt Predari  
Electric bells, &c. Automatic circuit opener or closer for..... C. C. & H. P. Rasmussen  
Electric cables. Machine for making armored..... E. T. Greenfield  
Electric cables. Manufacturing armored..... E. T. Greenfield  
Electric carrier attachment. Overhead..... H. M. Harding  
Electric controller..... C. T. J. Oppermann  
Electric elevator. Automatic..... H. Rowntree  
Electric furnace..... E. G. Acheson  
Electric meter. Coin controlled..... R. E. Bates  
Electric motor..... A. C. Eastwood  
Electric motor controlling device W. B. Potter  
Electrical propulsion of carriers. System for the..... A. D. Swegle  
Electrical protector..... C. A. Rolfe  
Electrode. Secondary battery..... J. Rahmann  
Electrolytic cell..... R. Johanns  
Electrostatic separator..... C. E. Dolbear  
Elevated carrier..... O. O. Jones  
Elevator..... J. Rice  
Elevator controlling device..... A. H. Bucklew  
Elevator driving mechanism..... M. A. Clennam  
Elevator electrical controlling system..... C. O. Mailloux  
Engine for derricks and cableways. Convertible..... A. Lambert  
Engine ignition plug. Explosive..... W. Roche  
Engine sparking mechanism..... A. M. Zimmerman  
Engine vaporizer. Gas..... A. M. Zimmerman  
Engines. Steam and governor connection for twin..... H. C. Clay  
Engraving..... H. C. Osborn  
Excavator..... P. Nelson  
Exercising device and striking bag support..... A. A. Hendrickson  
Explosives. Making..... H. Wasbers  
Extension table..... C. N. Smith  
Eyelet..... A. A. Kuehlhorn  
Facial defects. Device for correcting..... A. C. Cloud  
Fan motor. Electrical ceiling..... W. F. Phelps  
Feed water Device for removing impurities from boiler..... G. T. Conkling et al  
Feed water heater and filter..... A. de Bretteville  
Feed water heater. Boiler..... C. G. Taylor  
Feeder. Pneumatic..... E. M. Bassler  
Fence lifter..... B. Batdorff  
Fence machine. Wire..... J. Harris  
Fence maker's tool..... H. Cottrell  
Fertilizer..... A. Frank et al  
Fibrous material. Stop motion for machines for preparing..... 2 pats. C. T. Hawley  
Fields, roads, &c. Machine for clearing..... J. Zobei  
Filaments, sheets, or films from cellulose. Manufacture of..... C. H. Stearn et al  
File. Cabinet letter..... S. H. Wheeler  
Filter..... N. Stafford  
Filter..... F. E. Roberts  
Filtering substance and making same..... T. Wendling  
Fire alarm transmitter and signal. Automatic audible..... J. H. Munchausen  
Fire. Apparatus for rescuing persons from buildings in case of..... M. Schroter  
Fire extinguisher apparatus..... C. A. Teal  
Fire extinguisher. Chemical..... G. W. Coon  
Fireproof. Rendering fabrics..... G. Elenio  
Fireproof wall, &c..... J. Schratwieser  
Fishing reel..... W. G. Haas  
Floating battery..... A. P. Stokes  
Floor mat. Metallic..... E. J. Manning  
Fluid conducting pipe..... R. J. Decker  
Fluid motor. Rotary..... J. F. Cooley  
Forceps. Hernial..... J. H. Kochenderfer  
Forge. Portable..... A. J. Gurney  
Furnace..... R. H. Yeoman  
Furnace..... G. F. Rendall  
Furnace..... J. A. Vaughan  
Furnace bridge. Boiler..... R. F. Sturrock  
Furnace grate..... H. E. Reed  
Furnace top. Blast..... J. C. Cromwell et al  
Fuse block..... J. B. Morgan  
Gaining machine..... J. M. Strubel  
Game and game table..... O. Prybil  
Game apparatus..... H. J. Frysinger  
Game apparatus..... S. A. McKelvey  
Game board and man or game piece receptacle. Combined..... H. Van Altena  
Garbage furnace or crematory E. J. Little et al  
Garment. Bifurcated..... E. Arpin  
Garment hanger..... S. W. Bonsall  
Garment hook..... H. S. Brewington  
Gas bracket..... D. C. Cavanagh  
Gas burner and regulator for same A. A. Pratt  
Gas generator. Acetylene..... G. L. Wilson  
Gaseous fuel burner..... R. J. Miner  
Gear. Variable speed..... 2 pats. W. N. Dumaresq  
Go-cart or chair. Child's C. R. De la Sabliere  
Governor. Speed..... M. C. White et al  
Grain separator attachment..... J. Kennedy  
Grinding machine..... A. B. Landis  
Guns. Bearing for the elevating screw apparatus of field or other..... E. K. Rothe  
Hall rack and umbrella stand. Combined..... A. Johnson  
Hammer..... W. W. Brownell  
Harrow..... E. Riemenschneider  
Harrow. Moss..... W. Matouch  
Harvester threshing machine..... A. Haertlein  
Hatchway door..... M. Hegbom  
Heater..... A. Schutt  
Heater..... M. Barman  
Heater..... O. Jahluka  
Heating apparatus..... R. G. McAuley  
Heel rand making machine..... A. C. Heath  
Hinge..... J. Soss  
Hoisting apparatus..... A. V. Hysore  
Hook..... L. H. Bowman  
Horse releasing device. Vehicle..... J. F. Hinrichs et al  
Horseshoe calk..... B. McKenzie  
Hydrant..... 2 pats. A. I. Sandbo  
Hydrocarbon burner..... R. J. Miner  
Indicating and controlling apparatus..... C. O. Mailloux  
Ingot heating furnace 4 pats F. H. Daniels et al  
Inhaler..... A. Dow  
Insulating material. Manufacturing..... V. de Karavodine  
Insulator..... F. W. Gregory  
Journal box. Car..... J. Pearson  
Journal box dust guard. Railway..... A. J. McCauley  
Keyhole guard and door lifter..... M. S. Weller  
Kiln..... H. Stehmann  
Knife blade casings. Means for attaching face plates to..... E. H. J. Huebner  
Knob attaching mechanism..... C. J. Ericson  
Labeling machine..... F. H. Knapp et al  
Lace clasp. Shoe..... A. B. Rhinow  
Lace fastener. Shoe..... M. A. Clarkson  
Lacing hook..... D. Noble et al  
Ladder..... S. B. Benigar  
Ladder. Aerial..... F. S. Seagrave  
Ladder. Fire..... J. C. Schaller  
Lamp. Alcohol..... J. W. Chapman et al  
Lamp or heater. Safety kerosene oil P. Fraser  
Lamp. Vapor burning..... W. Tures  
Lantern dissolver. Single..... F. C. Edmonds  
Latch. Gate..... J. B. Sams  
Lathe for turning irregular forms..... H. Derrer  
Lathe taper attachment..... F. R. Lee  
Ledger..... F. Peters  
Lever handle lock..... E. Andrews  
Limekiln..... H. Ragot  
Lime squeezer and ice tongs. Combined..... C. A. Eberth  
Lock..... W. C. Dickerson  
Lock..... P. Seisler  
Lock..... C. F. Thyberg et al  
Lock attachment..... A. W. Livingston  
Lock for angle cocks, &c..... F. H. Mobley  
Locking device..... G. S. Nichols  
Log loader..... C. E. Evans  
Logging car stanchion..... J. A. Blanchard  
Loom warp stop motion..... H. Wyman  
Loom warp tens on mechanism H. Hautmann  
Loom water alarm. Steam boiler..... S. H. Ralph  
Magnet coil. Field..... C. R. & T. M. Meston  
Mail bag catching and delivery device..... M. D. Cummings  
Mail crane..... L. H. Rickles  
Manhole or other cover..... J. L. M. A. Reis  
Manual motor..... A. Brunelle  
Match box..... R. I. Deihl  
Mattress machine..... E. G. Wheeler  
Measuring and filling apparatus A. C. Wright  
Meat chopper..... R. Dettmer  
Mechanical movement..... J. A. Schnell  
Mechanical power..... S. Hayes  
Merchandise. Means for handling..... H. M. Harding  
Metal structure. Expanded..... G. J. Holl  
Mirror holder. Adjustable..... G. Becker  
Mop wringer..... O. N. Wardwell et al  
Motors. Means for preventing fluctuations in rotary..... J. J. Wood  
Necktie fastener..... J. Weil  
Nest. Hen's..... W. J. Dillard  
Net. Gill..... L. Hansen  
Nitrocellulose. Purifying..... F. I. Du Pont  
Nozzle. Fluid..... W. A. Doble  
Nozzle for humidifiers, &c..... Q. N. Evans  
Oil burner..... A. H. Van Pelt et al  
Oil burner with self supplying steam device. Crude..... E. I. Nichols  
Oil distributor..... J. B. Glover  
Oils. Solidifying and toughening..... J. B. Scammell et al  
Oiler..... G. J. Peacock  
Ore roasting furnace..... G. F. Rendall  
Ore separator..... H. G. Johnson et al  
Packing. Piston rod..... G. A. Harder et al  
Pail and shipping can. Minnow E. C. Bourne  
Paper making machine..... J. F. Obert  
Partition. Architectural..... J. A. Wheeler et al  
Pen. Fountain..... 2 pats. P. E. Wirt  
Pen. Ruling..... S. A. Floren  
Pencil holder and calendar. Combined..... W. D. Widders  
Perfecting press. Web..... J. L. Firm  
Piano pedal action..... J. Dierdorf  
Piling..... O. E. C. Hartung et al  
Pill coating machine..... E. C. Clark  
Pin holder..... G. A. Faas  
Pin tongue joint..... T. F. Greenwood  
Pipe carrier..... C. F. Porteous  
Plaster. Corn..... A. S. Hill  
Playing ball..... F. H. Richards  
Plow..... F. A. Mills  
Plow..... E. Haas  
Pneumatic tube terminal..... E. A. Fordyce  
Pole. Metallic..... W. Maxwell  
Pole tip..... J. Waddell  
Pool or other like ball..... H. L. Haskell  
Post base..... G. C. Winslow  
Power shears..... C. & A. McVicar  
Preserving perishable food products..... C. E. Davis  
Preserving perishable food products. Apparatus for..... C. E. Davis  
Pressure regulator..... N. C. Locke  
Printer's galley and chase. Combined..... F. P. Wilson et al  
Printing press..... 3 pats. J. L. Firm  
Printing press..... E. E. Flora  
Printing press folding and delivery device..... J. L. Firm  
Propeller..... R. Murr  
Propeller..... G. Quick  
Propeller. Boat..... J. H. Milligan  
Pulley or similar device. Sash..... A. Johnston  
Pump..... J. A. Ek  
Pump plunger..... E. Scott  
Pump. Relay..... E. W. Gragert  
Pump valve and valve actuating mechanism..... G. B. Petsche  
Quicksilver roaster..... A. Johnson et al  
Racer..... H. A. Cook  
Rail clamp..... W. S. Jones  
Rail joint..... J. F. Hollis  
Rails, &c. Apparatus for cleansing tram..... C. H. Jerrard  
Railway interlocking machine..... B. C. Rowell  
Railway rail joint..... J. G. McMichael  
Railway splice..... J. Mabus  
Railway splice. Locking..... J. Mabus  
Railway splice. Locking..... J. Mabus  
Railway switch..... C. E. Nowlin  
Railway system. Third rail electric..... W. G. Wagenhals  
Railway trains. Safety device for stopping..... T. T. Chaloner  
Railway vehicles or trains. Controlling system for..... G. Gibbs  
Record indicating device..... W. L. Trill  
Rein holder..... A. Carlson  
Rolling mill coupling..... V. E. Edwards  
Rope machine..... C. J. Banks  
Rotary expansion engine..... R. S. Matteson  
Rotary fluid engine..... J. F. Cooley  
Rotary motor..... J. M. Crowley  
Rubbing or polishing machine..... M. S. Goolley  
Rug fastener..... J. L. Kingston  
Sash lift..... C. P. Howard  
Sash lifting apparatus. Greenhouse..... W. O. Johnston et al  
Saw attachment. Band..... J. Catudal  
Saw filer..... D. L. Kelchner  
Scale. Weighing..... H. B. McNulty  
Seal for envelopes, packages, &c. J. O. Fleece  
Sealing machine. Envelop..... H. J. Williams  
Seat and back..... C. W. Emmons  
Seeding machine..... S. H. Jones  
Sewing machineawl mechanism..... H. A. Dodge et al  
Sewing machine rotary take-up..... J. Heberling  
Sewing machine ruffler..... A. Laubscher  
Sewing machine shuttle..... F. L. Babb  
Shade roller bracket and sash stop..... W. Crowther  
Sheet metal bending machine C. T. Tarpenning  
Shoe..... C. H. Goodwin  
Signaling apparatus..... F. W. Dunbar et al  
Silk lustering machine..... C. Stuart  
Skein scouring and dyeing machine..... J. W. Finegan  
Skirt elevator..... J. P. Sutton  
Skirt or train lifter..... H. M. Todd  
Sleigh..... A. C. Merrillet et al  
Smelting apparatus. Electrical R. L. Barnhart  
Smoke consuming apparatus. Furnace..... J. F. Zaruba  
Smoker's article..... A. C. Cornell  
Snow clearing machine..... F. C. Harris



Soap mold ..... V. Alexa  
 Solder ..... E. C. Rice et al  
 Soldering iron ..... C. R. Gutner  
 Soldering or joining can body seams. Apparatus for ..... G. W. Berry  
 Soles of boots or shoes to their inner soles. Attaching the outer ..... L. A. Casgrain  
 Sound recording and reproducing machine sound box ..... G. K. Cheney  
 Spark catcher. Locomotive O. H. Heydemann  
 Spectacle bridge. Rimless ..... F. A. Stevens  
 Spindle catch ..... M. Seveney  
 Spinning apparatus with rotating head ..... J. E. Schmidt  
 Stair structure ..... N. Bois  
 Stay. Dress waist ..... A. Nickerson  
 Steam drying apparatus ..... T. J. Nelson  
 Steam engine ..... H. G. Coustilla, Jr  
 Steam generator ..... C. H. Fox  
 Steam generator ..... H. Sinclair  
 Steel making ..... F. E. Young  
 Stereotype ..... A. L. Anderson  
 Sterilizer ..... R. H. Speare  
 Stoker. Mechanical ..... D. Hurst  
 Stone dressing machine ..... 2 pats. A. F. Jones  
 Stone molding machine. Artificial ..... N. F. Palmer  
 Stone tub ..... W. Greer  
 Stove ..... J. M. & S. R. Crowder  
 Stove or furnace ..... W. S. Beale  
 Stoves and chimneys. Hot air box for brick or tile ..... H. Niemczek  
 Stub runner and subsoil attachment therefor ..... W. Fetzner  
 Stud. Shirt bosom ..... J. W. Lawson  
 Stuffing box for flexible steam or gas turbine shafts ..... A. Schutt  
 Sugar molding apparatus ..... H. Passburg  
 Supervisor's assistant ..... S. N. Betts  
 Surgical truss ..... B. Chamberlain  
 Swinging gate ..... F. L. Price  
 Switch stand ..... 4 pats. A. B. Bellows  
 Syringe case. Hypodermic ..... B. T. Winchester  
 Syringe nozzle ..... J. T. Montgomery  
 Table ..... M. Manfred  
 Tag. Laundry ..... C. E. Smith  
 Tags, &c. Machine for stringing ..... J. C. Kimsey  
 Telegraph key ..... E. T. Thorpe  
 Telephone system ..... J. H. Mason  
 Telephone transmitter switch mechanism ..... C. Holmök  
 Tent wall clasp ..... E. Covert  
 Thermo electric battery ..... B. J. Hall  
 Thread unroller ..... S. W. Wardwell  
 Threshing machine. Pea ..... J. M. Brasington  
 Threshing machine self feeder ..... D. A. Simpson  
 Throw device. Variable ..... M. S. Gooley  
 Tire inflating device. Pneumatic A. de Gingsins  
 Tire. Pneumatic ..... W. Edmonds  
 Tire. Rubber vehicle ..... G. B. Dryden  
 Tire. Wheel ..... 2 pats. R. S. Graham  
 Tobacco pipe ..... A. Andren  
 Tool ..... N. Crane  
 Tool handle ..... A. Hilmo  
 Tool holder. Electric ..... M. Loewenthal  
 Tool. Impact ..... J. F. Clement  
 Tool. Machine ..... W. Sellers  
 Tool. Pneumatic ..... H. A. R. Prindle et al  
 Top. Spinning ..... F. L. Cook  
 Toy ..... H. G. Sammons  
 Toy ..... E. Sollmann  
 Trace detach ..... J. B. Blakeman  
 Track laying machine ..... M. B. Holman et al  
 Tray. Serving ..... H. L. Palmer  
 Trolley ..... C. A. Olsen  
 Truck ..... F. E. Caton  
 Truck jack. Car ..... C. Kofske  
 Trunk ..... W. Wohlrahe  
 Truss ..... A. A. Raymond  
 Tube welding machine ..... H. A. Ferguson  
 Tubing. Making ..... F. F. Bischoff  
 Tunneling shield ..... T. Cooper  
 Twine, &c. Cover or holder for balls of ..... A. Sheddock  
 Twine cutting device ..... J. W. Moss  
 Type writer ..... J. Alexander  
 Type writer bar movement ..... J. Alexander  
 Type writing machine ..... H. Cross et al  
 Type writer copy holder ..... F. E. Williamson  
 Vaccinating needle ..... O. Thomas  
 Valve ..... T. A. Knickerbacker  
 Valve. Bucket bottom ..... W. F. Norman et al  
 Valve controlling apparatus. Electromagnetic ..... I. G. Waterman  
 Valve. Cylinder relief ..... M. R. Zehnder  
 Valve gear. Steam engine slide ..... 4 pats. S. S. Younghusband  
 Valve mechanism. Time ..... A. W. Knox  
 Valve. Steam engine ..... J. F. Van Tuij  
 Vaporizing water. Means for ..... H. F. Wallmaun  
 Varnish. Composition for removing ..... J. E. Miller  
 Vehicle brake and coaster for cycles, &c. ..... W. Robinson  
 Vehicle controlling device. Motor ..... W. O. Worth  
 Vehicle draft attachment ..... W. D. Carson  
 Vehicle gear ..... A. P. McLellan  
 Vehicle propeller wheel ..... C. H. O. Hamann  
 Vehicle spring ..... A. Armstrong  
 Vehicle steering gear ..... J. & J. Field  
 Vehicle wheel ..... J. G. Westover  
 Voltmeter for the electrolysis of water ..... P. Garuti et al  
 Wafers, &c. Machine for cutting ..... H. H. Hungerford  
 Wagon brake ..... I. Sartain  
 Wagon brake ..... W. H. Loper et al  
 Wagon wrench and jack ..... D. Clary  
 Warp stop motion mechanism ..... C. H. Draper  
 Washboiler ..... E. Burns  
 Washing machine ..... N. Denier  
 Washing machine ..... M. J. Dunn  
 Washing machine operating means ..... J. R. Carter  
 Watchcase spring ..... C. Nobis, Jr  
 Watch movement boxes, &c. Holder for ..... C. J. Olney, Jr  
 Water cooler ..... Z. F. Bowman  
 Water meter ..... F. Lambert  
 Water to washstand basins, &c. Electrical control of the flow of ..... I. G. Waterman  
 Water tube boiler ..... F. M. Faber  
 Weather strip ..... S. E. Moore  
 Weft fork ..... J. H. Foster  
 Welding die. Link ..... W. N. Gourley  
 Welt butting machine ..... C. L. Eaton  
 Wheel ..... W. H. Lasswell  
 Wheel rim attachment. Traction ..... G. A. Laveuder  
 Whipp ..... H. F. Moore

Windmill ..... A. Morrisson  
 Window ..... F. O. Hultmark  
 Window casing and screen ..... F. C. & A. G. Eastman  
 Window cleaning apparatus ..... S. C. Lawlor  
 Window cleaning device ..... H. E. Bayer  
 Window cleaning safety chair ..... C. Buckel  
 Window lock ..... G. B. Hannan et al  
 Window screen ..... F. C. & A. G. Eastman  
 Window screen. Adjustable ..... E. S. Giles  
 Window. Storm ..... C. O. Dodge  
 Wire stretcher. Gate ..... J. M. Reiterman  
 Wrapping machine ..... L. Bonnefoi  
 Wrapping machine. Package ..... E. E. Miles  
 Wrench ..... J. Hoffman  
 Yoke and pole connection. Neck ..... E. C. Rishel  
 Zinc. Treating complex ores of ..... W. C. Wetherill

## DESIGNS.

Decalcomania transfer sheet ..... R. Whyte  
 Dish or similar article. Covered ..... A. Mountford  
 Dishes. Mounting for metal ..... S. H. Leavenworth  
 Flag or banner ..... W. B. Stevens  
 Glass vessel. Cut ..... W. C. Anderson  
 Glass vessel. Cut ..... 3 pats. W. Marrett  
 Ring ..... J. C. Miller  
 Stool leg ..... C. D. Orcutt

Issued April 14, 1903.

## MECHANICAL PATENTS.

Acid. Apparatus for the manufacture of sulfuric ..... O. H. Eliel  
 Air brake ..... C. W. Valentine  
 Air brake hose coupling and valve mechanism ..... G. B. Dinkins  
 Air compressor and heater ..... C. R. Keller  
 Amalgamating machine ..... A. H. Woodruff  
 Amusement device ..... A. Seyfried et al  
 Animal trap ..... R. Chasse  
 Automatic sprinkler ..... W. Morgan  
 Automobile brake ..... L. L. Hoffman  
 Axle box dust guard ..... N. H. Davis  
 Axle gage ..... F. J. Compliment et al  
 Badge ..... F. W. Pollock  
 Bag holder ..... G. E. Brown  
 Balance escapement ..... E. Buysse  
 Banana bunch hanger ..... M. F. Levy  
 Bar working machine ..... G. O. Gridley  
 Battery plate forming die ..... A. d'Arsonval et al  
 Beaming machine pressing attachment ..... J. McCallum  
 Bearing. Antifriction ..... A. E. Henderson  
 Bearing. Ball ..... A. E. Henderson  
 Bearing mechanism. Ball ..... J. E. Breitwiser  
 Bearing. Roller ..... A. E. Henderson  
 Bed bottom spring support ..... G. Brand  
 Bed bottom supporting spring ..... G. Brand  
 Bedstead ..... M. L. Cross  
 Bedstead corner fastener ..... W. S. Foster  
 Bellows motor controller ..... F. E. Whitney  
 Bicycle bearing ..... C. J. Dorff  
 Bicycle handle bar. Adjustable ..... T. H. Jacob  
 Binder. Temporary ..... W. S. Mendenhall  
 Blind. Window ..... E. A. Clark  
 Boat float arrangement ..... W. M. von Malein  
 Boats. Observing tube for submarine S. Lake  
 Boiler ..... R. Baggaley  
 Boiler tube cleaner ..... E. M. Adams  
 Bolt anchor ..... 2 pats. S. S. Newton  
 Bottle ..... H. De Rocco  
 Bottle closure ..... C. W. Scott et al  
 Bottle filling machine sight feed housing ..... L. Strebel  
 Bottle. Non refillable ..... T. C. De Hart  
 Bottle. Non refillable ..... J. C. Rosenkranz  
 Bottle. Non refillable ..... L. D. Parks  
 Bottle opener ..... I. E. Newell  
 Bottle stopper head ..... L. Strebel  
 Bottles, jars, &c. Device for stoppering ..... H. I. F. Strandh  
 Box stuff sawing and assorting machine ..... G. A. Smith  
 Bracelet or the like ..... E. P. Davis  
 Brake operating mechanism. Automatic ..... M. A. Born  
 Brake shoe ..... W. E. Gorton  
 Brake shoe ..... D. Rawstron  
 Brick handling and drying system ..... F. W. Dennis  
 Brick machine mold ..... H. J. Flood  
 Brick making machine ..... R. C. Bishop  
 Bridge ..... J. E. Noble  
 Bromin. Extracting ..... A. W. Smith  
 Brushes. Device for securing bristles in ..... P. Mobius  
 Building block grapple ..... H. B. Stephens  
 Button hook ..... J. L. Sommer  
 Cables or the like. Grip for ..... O. M. Sackett  
 Cake turner and culinary article ..... G. S. Ressler  
 Calculating machine ..... N. Goldfarb  
 Calendar. Perpetual ..... W. M. Finch  
 Calking seams of vessels. Apparatus for ..... C. G. Hightower  
 Camera ..... M. Schnell  
 Camera. Photographic ..... F. A. Brownell  
 Can ..... G. R. Turner  
 Can forming machine ..... R. J. Good et al  
 Can opener ..... F. Peffer  
 Can opener ..... L. T. Weiss  
 Can testing apparatus ..... J. G. & M. O. Rehfuss  
 Can top and bottom conveying apparatus ..... J. G. & M. O. Rehfuss  
 Cant hook ..... D. H. Langan  
 Canvas stretcher ..... W. J. Dorgan  
 Car bolster. Railway ..... J. A. Thorsell  
 Car brake ..... H. J. Powell et al  
 Car brake ratchet handle ..... P. C. Baggerman  
 Car. Center dumping ..... R. H. Hornbrook  
 Car construction ..... H. C. Buhoop  
 Car coupling ..... C. E. Lucas  
 Car coupling. 2 pats. ..... W. S. Schroeder et al  
 Car door. Freight ..... D. E. McLaughlin  
 Car. Electric ..... G. C. Hawkins  
 Car fender ..... J. H. Hulings  
 Car. Freight ..... H. A. Turner  
 Car rocker side bearing. Railway ..... A. O. Buckius, Jr  
 Car rocker side bearing. Railway W. H. Miner  
 Car rocker side bearing. Railway ..... F. B. Townsend  
 Car sash and panel cleaner and polisher ..... D. McCaffery  
 Carbonating apparatus ..... B. Adriance et al  
 Carbureter ..... J. Ruthven  
 Cardboard scoring machine ..... M. D. Knowlton

Carpet renovator ..... J. S. Thurman  
 Cartridge case ..... A. Barrallon  
 Caster ..... A. B. Diss  
 Caster ..... R. L. Dorsey  
 Caster. Ball ..... R. M. Grove  
 Caster. Ball ..... F. P. Magoun  
 Caster. Ball ..... C. Thomson  
 Cement or concrete structures with hollow walls, flues, &c. Device for building ..... W. H. Cadwell  
 Cement. Strengthened cast ..... J. Daime  
 Cementing substances ..... W. M. Kimberlin  
 Centrifugal machine ..... W. G. Hall et al  
 Centrifugal machine ..... F. Hampl  
 Chair ..... J. A. Whitcomb  
 Channels. Apparatus for forming navigable ..... L. W. Bates  
 Channels. Forming navigable ..... L. W. Bates  
 Cheese cutter ..... C. G. Winn  
 Chocolate blocks or tables. Machine for molding ..... P. R. Franke  
 Chuck ..... P. F. Krug  
 Chuck. Drill ..... J. J. McDonough  
 Churn motor ..... R. B. Thompson  
 Churn power ..... F. F. Sims  
 Cigar lighter ..... J. J. Fleming  
 Cigarette paper with tips. Means for providing ..... M. Nast  
 Circuit closing device ..... H. P. Ball  
 Cloth cutting machine ..... C. A. Amelang  
 Clothes hook ..... J. M. Merrill  
 Clothes line. Pinless ..... W. A. Jennings  
 Clutch. Pneumatic ..... C. B. Goodspeed  
 Coat and hat rack ..... R. E. Hart  
 Coat hanger ..... H. C. Hinchcliff  
 Coating apparatus. Electrolytic ..... H. W. Botz  
 Coffee pot ..... C. H. Atkins  
 Coke oven doors. Means for removing ..... E. A. Moore  
 Coking oven ..... R. S. Moss  
 Collar blanks, &c. Machine for folding ..... G. J. Dormandy  
 Compass attachment ..... J. L. Bliss  
 Concrete conduits. Form or center for molding the inverts of ..... W. F. Learned  
 Condenser system ..... W. C. Brown  
 Conveyor. Bucket ..... A. L. LeGrand  
 Copper from carbonates and oxid ores. Extracting ..... H. R. Ellis  
 Corset clasp ..... S. Kennedy  
 Crane ..... A. L. & O. Anderson  
 Crank disks or gears against end movement. Means for securing ..... J. Thomson  
 Crupper stuffer ..... J. B. Bastain et al  
 Crutch ..... G. C. Calentine  
 Cultivator ..... M. G. Graham  
 Cultivator. 2 pats. ..... J. B. Bartholomew  
 Cultivator ..... J. Schalk  
 Cultivator shovel ..... A. L. Johnson  
 Cultivator. Wheel ..... E. S. Slough  
 Current apparatus. Alternating ..... 2 pats. J. F. Kelly et al  
 Current motor. Alternating ..... A. W. Schramm  
 Current motor system. Alternating ..... S. Krohn  
 Current motors. Device for varying the number of poles in alternate ..... R. Dahlander et al  
 Currycomb ..... J. H. A. Wille  
 Curtain stretcher ..... M. M. Hedden  
 Cut out. Automatic ..... I. Kitsee  
 Dehorning knife ..... J. D. De Celle  
 Dental chair ..... I. N. Brigham  
 Dental plate ..... S. G. Suoplee  
 Deodorizing or disinfecting apparatus ..... M. Jacobs  
 Derail ..... E. C. Carter  
 Dipping machine ..... W. S. Foster  
 Display case ..... C. E. Latshaw  
 Display stand ..... H. I. & M. A. Lurye  
 Distribution system ..... A. D. Lunt  
 Door track and hanger. Sliding ..... T. C. Prouty  
 Door track. Rolling ..... T. C. Prouty  
 Door way ..... A. F. Gerald  
 Draw bar rigging ..... R. W. Fox  
 Dredger. Canal ..... E. Chaquette  
 Drilling machine ..... A. W. Wigglesworth  
 Dry closet ..... S. Davis  
 Dyanamo brush holder ..... E. Gaud  
 Egg beater ..... C. A. Taplin  
 Electric motors. Device for maintaining constant speed in ..... J. G. Roberts  
 Electric switch ..... T. Cope  
 Electric time switch ..... E. Hemphill  
 Elevator ..... J. G. Scott  
 Elevator cage stop latch ..... E. Pocher  
 Elevator gate operating mechanism ..... J. E. W. Fogal  
 Elevator safety device ..... E. H. Price  
 Engine driving gear ..... C. Phillips  
 Engine electric igniter. Explosive ..... 2 pats. G. A. Goodson  
 Engine ignition chamber. Gas ..... A. A. Low  
 Engine muffler ..... R. P. Thompson  
 Engine piston ..... H. M. Quick  
 Engine speed regulator. Oil ..... W. A. Whiting  
 Envelop and writing sheet ..... A. H. Lewis et al  
 Envelop machine ..... F. B. Powers  
 Explosive engine. Oscillating piston ..... J. A. Jenney  
 Eyeglass spring and guard lock ..... H. S. Peters  
 Fabrics. Border for the edges of ..... G. W. Merrow  
 Fan ..... C. W. Lund  
 Fan. Electrically driven centrifugal blast ..... H. K. Grull  
 Fastening device ..... A. Stambach  
 Feed trough ..... J. J. Smith  
 Fiber. Cooking cellulose ..... F. E. Gore  
 Fiber manufacturing apparatus ..... F. E. Gore  
 Figure. Jointed ..... A. Schoenhut  
 File attachment. Index ..... W. E. Ball  
 File. Letter or similar ..... W. J. Richardson  
 Filling vessels with liquids. Apparatus for ..... C. F. Mendham  
 Fire alarm system regulator ..... D. T. Spring et al  
 Fire alarm systems. Circuit breaker for ..... D. T. Spring et al  
 Fire escape ..... A. Boisclair  
 Fire escape ..... A. B. Holson  
 Fireproof door or shutter ..... J. C. Mallory  
 Fisherman's hat-band ..... W. A. Wetmore  
 Fishing tackle ..... T. J. Evans  
 Floor and hardwood scraper ..... J. R. Price  
 Floor oiling device ..... 2 pats. J. C. O'Donal  
 Folding shade chair ..... F. T. B. Mann  
 Foot power ..... O. H. Gentry  
 Fruit jar ..... D. G. Carpenter  
 Furnace ..... E. H. Schwartz  
 Furnace fire gate ..... H. A. Poppenhutzen  
 Furnace for heating or melting materials ..... W. P. Thompson

Game apparatus ..... A. Mueller  
 Gas administering apparatus ..... G. Clarke  
 Gas analyzing apparatus ..... M. Arndt  
 Gas apparatus. Acetylene ..... D. Barnard  
 Gas burner ..... E. C. Merrill  
 Gas burner ..... R. B. Fageol  
 Gas check. Adjustable ..... J. F. W. Jost  
 Gas engine ..... H. C. Strang  
 Gas generator. Acetylene ..... N. A. Renstrom  
 Gas generator. Acetylene ..... C. W. Metcalf  
 Gas light heater ..... W. F. Young  
 Gas light. Incandescent ..... G. S. Barrows  
 Gas or electric light. Portable ..... J. E. Bohner  
 Gas producers. Automatic fuel feeding device for ..... J. G. Sanderson  
 Gas works valve ..... E. A. Moore  
 Gases. Apparatus for separating and collecting impurities from metallurgical furnace ..... E. J. McAleer  
 Gasolene burner ..... C. L. Hall  
 Gate ..... A. B. Cameron  
 Gear. Variable speed ..... M. Crawford  
 Gearing. Variable speed mechanism for back ..... R. K. LeBlond et al  
 Glass. Apparatus for manufacturing sheet ..... P. T. Sievert  
 Glass cutting machine ..... L. Rouault  
 Glass. Manufacturing sheet ..... P. T. Sievert  
 Glove fastener ..... A. Bernauer  
 Gold extraction process ..... T. B. Joseph  
 Governor. Engine ..... J. H. Snell  
 Governor. Speed ..... J. T. Rossiter  
 Grain drill ..... C. H. Mason  
 Grinding machine ..... W. V. Robinson  
 Grinding mill ..... J. C. Wegeriff  
 Grinding or polishing machine ..... B. F. Merritt  
 Gun bearing ..... J. Strauss  
 Half tone screen ..... J. Jacobson  
 Hammer. Horseshoer's ..... E. G. Weitz  
 Hammock ..... I. E. Palmer  
 Hanging bracket ..... W. H. Perkins  
 Harrow ..... J. P. Pfeiffer et al  
 Harrow ..... W. L. Dempsey  
 Harvesters. Endless belt carrying frame for ..... J. Johnson  
 Harvesting machine ..... S. H. & J. H. Beller  
 Harvesting machine. Self binding ..... M. Stimpson  
 Hay rake attachment ..... J. P. Whitlock  
 Heat regulator ..... A. J. Hopkins  
 Heating apparatus. Hot water ..... I. D. Smead  
 Heating system ..... A. Glaser et al  
 Heating systems. Return water feed for steam ..... G. F. Brown  
 Hinge ..... J. T. Flippen  
 Hinge ..... J. Gamache  
 Hook ..... M. S. Farmer  
 Hook ..... J. Wahlberg  
 Horse detach ..... M. L. Robinson  
 Horseshoe ..... H. Burrus  
 Hose supporter ..... J. H. Pilkington  
 Hose supporter ..... H. C. Hine  
 Hose supporter ..... E. N. Humphrey  
 Hub attaching device ..... S. S. Thomp  
 Illuminating device ..... W. S. Traill  
 Induction motor ..... 2 pats. A. L. Cushman  
 Ink well ..... H. Snell et al  
 Insulator ..... C. Clayton  
 Interlocking switch and signal ..... G. W. Speckman et al  
 Jar or bottle closure ..... F. C. Riely  
 Joist anchor box ..... R. W. Whitehurst  
 Jug. Dripless ..... F. J. Gallagher  
 Key opening can ..... W. H. Wells  
 Kiln ..... C. E. Watts  
 Knitting machine ..... A. N. Ames  
 Lace, &c. Apparatus for cutting applique ..... P. P. Craven  
 Ladder ..... W. Williamson  
 Ladder. Combination step ..... B. F. Sturgeon  
 Lamp. Acetylene ..... H. Lucas  
 Lamp. Electric arc ..... H. P. Wellman  
 Lamp globe holder. Arc ..... C. E. Hartman  
 Lamp socket. Electric incandescent ..... G. H. Proctor  
 Lamp wick attachment ..... J. H. Stone  
 Lamps with fuel. Caloric engine for supplying gas ..... C. Scott Snell  
 Land roller ..... F. Horne  
 Lantern. Signal ..... E. H. Wade  
 Last ..... J. T. Brown  
 Lasting machine ..... C. Eisenberg  
 Latch ..... F. I. Ackerman  
 Lath. Metallic ..... V. Moeslein  
 Letter embossing machine ..... W. G. Reynolds et al  
 Letter, &c. Device for forming ..... W. F. Blount  
 Lifting and dropping gate ..... A. Clawson  
 Link. Fusible ..... C. B. Shaw et al  
 Liquid drawing off apparatus ..... A. Brake  
 Lixivating machine centrifugal ..... H. R. Ellis  
 Lock ..... J. Speer  
 Lock ..... H. P. Townsend  
 Loom. Automatic filling replenishing ..... L. A. Aumann  
 Loom. Automatic filling replenishing ..... W. F. & C. H. Draper  
 Loom picker stick buffer ..... M. Dumont  
 Lubricator ..... E. E. Davis  
 Magnet frames of dynamo electric machines. Device for shifting the field ..... W. F. Dawson  
 Mail box ..... A. L. Henry  
 Mail box ..... J. Lieber  
 Mail crane ..... A. P. Bower  
 Mandolin or similar instrument attachment ..... J. M. Timmons  
 Marking machine ..... W. P. Dun Lany et al  
 Mattes and raw metals. Treatment of ..... H. G. C. Thofehrn  
 Mechanical movement ..... P. Christian  
 Metal hoop making machine ..... J. E. Wright  
 Metal plates or sheets. Treating ..... A. J. Diescher  
 Metal working machine ..... A. M. Stillman  
 Metallic oxides with metallic aluminum. Reducing ..... F. C. Weber  
 Mineral grading apparatus ..... H. W. Ash  
 Miner's tool ..... A. V. Des Moines  
 Miter finder ..... G. Duncan et al  
 Mitten ..... J. F. Campbell  
 Mold flask partition ..... G. Rader  
 Mop wringer ..... C. J. Johnson  
 Motion checking device ..... O. F. Persson  
 Motor ..... C. H. Peck  
 Motor for hoists, &c. ..... C. H. Peck  
 Mower. Lawn ..... S. L. Beuson  
 Mowing machine ..... R. L. Neville  
 Music cabinet. Sheet ..... O. H. Stewart  
 Music sheet for mechanical musical instruments ..... R. W. Pain  
 Musical instruments. Electric circuit closing mechanism for keyed ..... E. M. Skinner  
 Mustache trainer ..... J. G. Stephens et al



Musical instruments. Self playing attachment for keyboard..... F. W. Draper et al  
Nail or tack driving implement..... E. Parent  
Nitrogen compounds Making..... F. E. Polzeniusz  
Nozzle. Self closing..... F. Schwaab et al  
Nut and bolt lock..... J. Wheat et al  
Nut lock..... R. P. Griffith  
Oil bearing materials. Treating..... N. B. Powter  
Oil burner..... J. S. Thurman  
Oil burner. Nebulizing..... J. Proper  
Oil fuel burning apparatus..... J. S. Chapman  
Ophthalmoscope..... S. A. Rhodes  
Ore roasting furnace..... T. Edwards  
Ore separator..... J. W. Wolfe  
Ore treating apparatus..... S. C. C. Currie  
Oven. Bake..... W. Frohne  
Packing box..... J. H. Rose  
Packing. Metallic..... E. James  
Packing. Metallic..... G. D. Rollins  
Packing. Piston or rod..... H. Jandin  
Pail separator. Candy..... F. B. Davidson  
Paper making machine..... I. Kitsee  
Paper roll support..... S. S. Eccleston  
Pasteurizer..... B. F. Schirmer  
Pattern drawing machine..... J. C. Bradley et al  
Pattern fabric and making same..... H. Panitschek et al  
Pavements for use. Apparatus for preparing mineral ingredients of bituminous macadam or other..... H. W. Ash  
Pencil tape holding attachment. Lead..... B. B. Waring  
Penholder. Ejecting..... J. E. Mote  
Perambulator..... F. E. Southard  
Petroleum engine..... R. O. Allsop  
Photographic print..... H. C. & H. C. White  
Pianoforte frame, bridge and soundboard..... C. R. S. J. Halle  
Piling. Metal sheet..... H. Wittekind  
Pipe connection. Soil..... J. M. C. Glass  
Pipe coupling..... W. M. Wosoff  
Plane. Carpenter's..... J. W. Kirby  
Planter. Corn..... P. Grosbetty  
Plow wheel attachment. Sulky..... C. A. Glass  
Pneumatic signal..... J. H. Brady  
Poke. Animal..... R. G. Morris  
Post anchor..... J. Blackburn  
Post cap..... R. W. Whitehurst  
Potato sorter and grader..... E. Taylor  
Power transmitting device..... A. W. Wigglesworth et al  
Pralines. Machine for making..... P. R. Franke  
Press..... K. S. Blanchard  
Printer's inking roller..... J. H. Osgood  
Printer's inking rollers. Mold for casting..... J. H. Osgood  
Printing and issuing machine. Ticket..... J. P. Eastman et al  
Printing frame..... G. A. McMenimen  
Printing or embossing machine impression latches. Apparatus for operating platen..... F. W. Thomas  
Printing press inking mechanism..... J. Thomson  
Printing press. Platen..... 2 pats. J. Thomson  
Printing presses. Apparatus for securing ink distributing cylinders to platen..... J. Thomson  
Projectile..... C. V. Wheeler et al  
Propeller..... A. W. Leonard  
Propeller. Ship's..... G. R. Noblet  
Propeller wheel..... C. L. Webber  
Pulley. Expanding rope..... D. N. Bertram et al  
Pulley. Sash cord..... W. R. Madison  
Pulp beating engine..... F. J. Marshall  
Pump. Oscillating..... H. E. Schrader  
Pumps, &c. Valve gear for..... E. Crowe  
Quilting frame..... R. P. McKinley  
Rail brace..... D. M. Watson  
Rail guard. Third..... C. W. Hornung  
Rail joint..... F. P. Butts  
Rail joint..... H. & W. A. Glinsky  
Rail joint..... P. C. Osteen  
Rail joint chair..... T. Elrod  
Rail loader..... G. R. Huntington et al  
Railway bumper..... S. P. McGough  
Railway rail joint..... J. G. McMichael  
Railway rail joint connecting plate..... R. B. Charlton  
Railway safety gear and signal system..... J. J. Moore  
Railway switching apparatus..... W. F. Bossert  
Railway tie. Metallic..... C. B. Ebert  
Railway tie. Metallic..... C. S. Seitz  
Railway track. Mobile..... P. Montsabe  
Razor stropping device..... F. R. & O. Kampfe  
Reamer..... J. Shaw  
Regenerator furnace..... G. Campion et al  
Rein spread roller..... W. J. Scott  
Resistance coil..... E. F. Northrup  
Retort..... F. B. & C. E. Felt  
Reversible motor..... C. H. Peck  
Reversing mechanism..... A. Crawley  
Rheostat..... J. P. Ball  
Rock drill..... L. E. Decker  
Rolls. Adjustable bench for..... H. E. Sheldon  
Roof..... T. B. Stewart  
Root extractor..... F. R. Holden  
Rope clamp..... J. L. Smith et al  
Rope lock..... L. M. Cutting  
Rotary engine..... J. H. L. & J. D. A. Bottcher  
Rotary engine..... W. H. Cornell  
Rotary fluid engine..... J. F. Cooley  
Rotary steam engine..... J. McCall et al  
Sad iron. Self heating..... J. C. Lake  
Safe..... J. Wartenberger  
Salt and pepper shaker. Combined..... H. F. Thurston  
Sash lock..... J. D. Miller  
Sash stile plowing and boring machine..... A. A. Loetscher  
Sashes, &c. Adjustable tongue and groove member for window or screen..... E. Hipolito  
Sauer-krout, &c. Follower for packing..... W. Saenger  
Saw..... J. H. Miner  
Scale. Computing platform..... J. H. Milburn  
Scenic apparatus..... F. W. Thompson  
Scroll bending machine..... G. Boehm  
Seam. Garment..... N. E. Johnson  
Seaming machine. Sheet metal lock..... R. T. Smith et al  
Seed dropping mechanism..... A. C. Lindgren  
Seeder and fertilizer dropper..... W. Marcum  
Self locking bolt..... J. P. Ruark  
Sewing machine feeding and edge controlling device..... W. H. Stedman  
Sewing machine guide. Shoe..... J. Lapointe  
Sewing machine. Looped fabric..... F. E. Morris  
Sewing machine. Overseam..... W. H. Stedman  
Shade holder..... C. J. Kusche  
Shade holding mechanism 2 pats..... H. H. Forsyth

Shaft holder..... G. Jr., & M. Gerould  
Shelf bracket..... H. G. Voight  
Shirt waist fitter..... M. E. Buckley  
Shoes. Welting for welt..... J. B. Hadaway  
Shutter worker..... J. H. Rose  
Sign..... C. A. Tyndall  
Signaling system..... N. Tesla  
Silk holder..... S. V. Luallen  
Silo..... J. C. Schreder  
Sink cleaning composition..... T. Meyerhugh  
Siphon filling apparatus..... L. P. Setzler  
Skirt supporter..... H. M. Fox  
Slack adjuster..... E. G. & H. G. Schorrt  
Sled knee..... F. O. Stark  
Slicer. Bread..... A. Bolduc  
Slicer. Fruit or vegetable..... J. A. Lallemant  
Smoke consumer..... J. T. Coyne  
Smoke consuming furnace..... W. Jourdan  
Snaphook..... F. J. Shepherd  
Soda. Cleaning..... D. W. Gill  
Sodium bicarbonate. Making..... F. M. & D. D. Spence et al  
Solder from sheet metal cans. Means for removing superfluous 2 pats..... O. S. Fellows  
Soldering the side seams of sheet metal bodies. Horn for..... R. T. Smith et al  
Sower. Broadcast seed..... T. V. Page et al  
Speed changing mechanism..... R. K. Le Blond et al  
Speed changing mechanism..... A. E. Robinson et al  
Spinning, doubling, and twisting machine brake shoe..... J. Duffy  
Spring leaves. Forming gib seats on..... C. A. Contant  
Spur rowel frames. Spur leather for securing in position..... J. D. & D. J. Strus  
Square and bevel. Combined try C. R. Bannih  
Square. Draftman's T..... E. C. Amidon  
Square. Try..... W. G. Clements  
Stacker. Pneumatic..... C. N. Leonard  
Stacking apparatus. Straw..... A. A. Minkler  
Stairway..... O. C. Uehling  
Stake holder. Folding..... G. W. Lutz  
Starch making apparatus..... W. H. Uhlend  
Steam boiler..... G. Cawley  
Steam engine..... C. & C. Volz  
Steam generator furnace..... A. M. Deprez et al  
Steam separator..... M. W. Cottle  
Steering check. Electromagnetically operated..... H. Lempp  
Stereogram and making same. Parallax..... F. E. Ives  
Stereoscopic print and making same..... H. C. & H. C. White  
Sterilizing appliance..... E. Nichols  
Stirrup..... J. M. Birtels  
Stone, granite, or marble cutting machinery..... S. W. Vint  
Stop mechanism. Machinery..... T. J. Landrum et al  
Storage battery..... W. Gardiner et al  
Storage battery..... R. N. Chamberlain  
Stove. Lamp..... A. F. Glaessner  
Sunshade. Body attachable..... C. E. Gill  
Surveying instrument..... G. M. Gouyard  
Suspenders..... A. M. Ziegler  
Suspenders..... H. C. Hine  
Suspenders..... M. Gluckauf  
Suspenders..... H. C. Hine  
Sweat pad. Thin rim..... M. H. Fetzer  
Swing. Lawn..... D. H. Bausman  
Syringe. Vaginal syringe..... O. P. Moon  
Table device for sick beds, &c. W. Schleuning  
Tacks or nails. Knife for machines for making..... J. N. Gifford  
Telegraph instrument..... C. E. Bunker  
Telegraph key..... C. E. Bunker  
Telegraphy..... H. A. Rowland  
Telegraphy. Space..... 2 pats. J. S. Stone  
Telegraphy. Wireless or space..... J. S. Stone  
Telephone call register..... W. Gray  
Telephone hook lock. Coin actuated..... J. E. Head  
Telephone system..... T. Paul  
Thermostat..... H. W. Germinier  
Threshing machine band cutter and feeder..... H. W. Eisenhart  
Tile. Flooring or paving..... C. H. Puls  
Tile. Illuminating..... J. Jacobs  
Tires..... P. W. Litchfield  
Tires. Apparatus for manufacturing and vulcanizing rubber..... F. A. Seiberling  
Tires. Means for repairing punctured pneumatic..... C. R. Sutton  
Tobacco clamp..... G. L. Pool  
Tobacco for manufacture into cigars, &c. Machine for preparing leaf..... 2 pats. P. H. Ertheiler  
Tongue protector..... J. S. C. Nicholls  
Tool holder..... J. Armstrong  
Tool motor. Portable..... C. H. Peck  
Tool. Pneumatic..... C. H. Haeseler  
Toothpick..... J. E. Hills  
Torch. Signal..... F. & W. Dutcher  
Toy box of bricks..... M. E. Brandt  
Toy cannon..... W. Frowe  
Toy gramophone hand motor..... E. R. Johnson  
Toy. Mechanical..... J. Flaherty  
Toy pistol..... C. A. Bailey  
Toy vehicle..... H. N. Parker  
Transparency. Trichromatic..... F. E. Ives  
Trimming..... G. W. Merrow  
Trimming or braid. Reeded..... J. Heimann  
Trolley head..... S. Fierbaugh  
Trolley wheel..... E. C. Rolfe  
Trolley wire clamp..... H. Geissenhoner  
Truck. Car..... G. W. King et al  
Truck. Car..... G. G. Floyd  
Trucks. Roller side bearing for car..... 2 pats. E. S. Woods  
Tubes. Verifying apparatus for dressing..... F. Stordeur  
Tunnel. Subaqueous..... I. A. Braddock  
Turbine engine..... J. A. Groshon  
Turbine. Steam..... W. L. Webster  
Twine holder and cutter..... S. R. Earnest  
Typewriter..... S. J. Seifried  
Typewriter paper carriage..... S. J. Seifried  
Unloading apparatus..... C. Campbell  
Valve..... C. E. Tetley et al  
Valve..... W. N. Wemmer  
Valve. Automatic dry pipe..... L. D. Chandler  
Valve. Balanced slide..... G. A. Janicke  
Valve. Engineer's brake..... R. C. Augur et al  
Valve. Fluid pressure engine rotating..... W. & J. Vivian  
Valve for rain conductor pipes. Automatic gate..... J. Keller  
Vehicle. Motor..... A. N. Locke  
Vehicle power drum..... C. E. Duryea

Vehicle. Self propelled..... M. Crawford  
Vehicle. Self propelling..... A. A. Ball, Jr  
Vehicle speed changing and clutch mechanism. Motor..... L. Renault  
Vehicle steering check..... H. Lempp  
Vehicle transmission gear. Motor..... A. L. Riker  
Vehicle wheel..... M. J. Clark  
Vending apparatus..... M. S. Cody  
Vent controlling device..... C. W. Winther  
Ventilator head..... E. T. Klein  
Vessel air ejecting apparatus..... G. Quanonne  
Vessel. Cargo transport..... W. G. Clark  
Wagon..... J. D. Whitney  
Wagon body lifter..... H. B. Bolen  
Wagon. Coal..... L. Kreutler et al  
Washboiler and water distilling apparatus. Combined..... J. T. Van Ausdal  
Washbasin. Stationary..... J. Reid et al  
Washing machine..... T. E. Barrow  
Washing machine..... T. Henry  
Washing machine..... M. J. Kremer  
Washing machine..... C. Garver  
Washing machine..... D. Hawley  
Water closet..... R. W. Miller  
Water closet ventilator..... A. Drouillard et al  
Water cooler or heater..... J. H. Rose  
Water gate. Irrigating..... W. H. Kiler  
Water trap..... J. S. Conwell et al  
Water tube boiler..... J. P. Snedden  
Watering apparatus..... J. R. Goodwin et al  
Weather strip..... W. C. Dillon  
Weeder. Beet..... J. B. Strehl  
Weighing machines. Registering means for coin controlled..... G. F. W. Schultze  
Well drilling machine coupling..... H. G. Johnston  
Well strainer..... J. Morris  
Whiffletree hook..... W. Wainright  
Whip rack..... D. G. Bonderson  
Winch head. Reversible..... J. G. Delaney  
Windmill tower..... H. C. Will  
Windlass..... M. F. Cabill  
Window cleaner..... A. Roberts, et al  
Window lock..... J. E. Crawford  
Window screen..... E. B. Crocker  
Wire drawing machine..... J. H. O'Donnell  
Wire drawing machine drawing roll or head..... J. H. O'Donnell  
Wrench..... R. J. Lockhart  
Wrench..... R. J. Northam  
Wrench..... T. A. Weston  
Wrench attachment. Drill..... E. C. Miller  
X-ray apparatus, &c. Desk for..... H. R. Smith  
X-ray tube..... T. Friedlander  
Yeast coating composition..... M. Schmitz

## DESIGNS.

Coffee-urn hot water jacket..... E. Kronman  
Display frame..... O. W. Kennedy  
Fabric..... A. J. Bendix  
Partition. Ornamental..... C. F. Kade  
Soap cake..... E. Ross  
Spoons, forks, &c. Handle for..... J. Clulee  
Stool leg..... C. D. Orcutt  
Stove..... E. Ambrose  
Teething ring..... C. A. Dunn

Issued April 21, 1903.

## MECHANICAL PATENTS.

Abrading material..... J. M. Nash  
Adding machine..... S. Hartmann  
Adjustable gage..... W. G. Templeton  
Advertising device..... C. F. Echternach  
Advertising matter. Conveyance for displaying..... R. H. Neff  
Air conduit coupling..... E. G. H. Stein et al  
Air. Cooling, drying, and purifying..... W. L. Moore  
Air or gas compressors. Unloading device for..... W. S. Fairhurst  
Air ship..... T. Michelson  
Alumina. Obtaining..... C. A. Doremus  
Animal trap..... E. M. Walker  
Animal trap..... J. Campbell, Sr  
Atomizer..... M. Goldman  
Automatic potential regulator..... 2 pats. A. A. Tirrill  
Automobile engine. Foot starter mechanism for..... D. F. Graham et al  
Awl..... J. P. Brady  
Axle. Tubular vehicle..... C. S. Smith  
Axle. Vehicle..... G. W. Wilson  
Bag holder..... C. Kenney  
Baldric fastener..... E. O. Zimmerman  
Baling press..... J. T. Renas  
Baling press..... C. E. Hardie  
Bandage..... E. L. Ewing  
Bandage. Catamenial..... W. F. Laux  
Bank. Savings..... T. W. Mill et al  
Basins, &c., to slabs. Means for securing..... W. A. Keen  
Basket. Plant..... A. Lord  
Bearing cages. Manufacture of roller..... L. W. Noyes  
Bed brace..... C. A. Howse  
Bed bottom..... W. D. Hunt  
Bed covering..... A. W. R. Berr  
Bed slat..... V. T. Grabs  
Bed. Spring..... J. H. Thomas  
Bedstead..... A. Stedman  
Beefsteak. Hand roller for cutting and tendering..... S. P. Hastings  
Belt fastener..... J. C. Miller  
Belt. Metallic..... W. J. Egan  
Bench..... J. A. Franz  
Bicycle handle..... L. S. Fletcher  
Bicycle motor tender..... W. J. Belcher  
Bicycle track..... S. M. Howard  
Bills. Device for holding and filling blank..... G. J. Knopf  
Binder. Transfer..... S. A. Neidich  
Blowpipe. Automatic..... A. A. Prinzen  
Boat. Submarine..... H. H. Morrell  
Boat. Submarine..... S. Lake  
Boats, barbettes, &c. Apparatus for facilitating the sighting of distant objects from submarine..... H. Grubb  
Boiler separator. Steam..... R. H. Goacher  
Boiler water purifying device. Mechanical..... E. G. Rust  
Book holder. Manifold..... C. S. Binner  
Book mark or indicator..... S. C. Straker  
Book. Sales check..... A. A. Henkle  
Bottle. Non refillable..... A. A. Donham et al  
Bottle. Non refillable..... E. Hoerichs  
Bottler's protective device..... E. J. Sheehan

Bottle stopper..... A. J. Kempien  
Bottle stopper and fitting..... J. F. Fitzsimmons  
Bottles or tubes of liquefied carbonic acid, &c. Apparatus for discharging..... J. Camus  
Bottles or vessels. Fitting and case for ink or like..... J. F. Litzsimmons  
Box blank cutting and creasing roll..... E. A. McMillin  
Brake beam..... R. H. Hornbrook  
Brake mechanism. High speed..... E. G. Shortt  
Brake wheel..... P. D. Schenck  
Bread and cake rack..... J. Kopp  
Brick mold drying shed..... F. Danks  
Brick or briquet making machine..... J. W. & G. W. Ferguson  
Bridge construction..... J. F. Morton  
Bridge. Road..... H. Friend  
Bridle check..... G. E. Latimer  
Brine. Purifying..... G. N. Vis  
Briquet mold..... J. W. Bramwell  
Broom..... J. F. Ossenfort  
Brush. Bicycle..... W. Henn, Jr  
Bucket. Clam shell..... S. Swedenborg  
Buckle. Suspender..... S. S. Singer  
Buffer..... J. S. Thompson  
Buffer and coupling. Central..... G. Johnston  
Burglar alarm..... R. M. Dunkin  
Burner..... R. Livingston  
Butter. Refining and preserving..... H. Iscovesco  
Button drilling machine..... S. P. MacCordy  
Button polisher..... J. P. Vordermark  
Buttonhole shears..... C. B. Goldsmith  
Cabinet. Door step..... F. Burns  
Caddy bag..... G. L. Pierce  
Calsson on coffer dam..... D. E. Moran et al  
Calendar..... F. F. Pulyer  
Camphene. Making..... K. Stephan  
Can making machine..... E. Small  
Canal and power generating system..... C. S. Bradley  
Cane and stool. Combined..... C. W. Heeg et al  
Cane cutting knife and stripper..... N. Asbell  
Car. Bottom dumping..... R. H. Hornbrook  
Car construction. Steel..... W. F. Kiesel, Jr  
Car coupling..... J. Sines  
Car drop brake handle..... A. U. Willing et al  
Car. Freight..... H. R. Keithley  
Car seat..... J. E. Siegel  
Carbon dioxide. Treating substance with masscent..... W. Smethurst  
Card or picker machine fire extinguisher..... G. B. Stover  
Carpet or rug beater..... H. G. Cady  
Carpets, &c. Apparatus for cleaning..... F. J. Farrell  
Cattle mark..... R. Schumann  
Cement for uniting wood..... J. H. J. Bartels  
Cement kiln..... W. W. Macclay  
Centrifugal machine driving mechanism..... H. Feldmeier  
Centrifugal separator..... C. J. Phil  
Chimney protector..... W. I. F. Harden  
Chuck. Lathe..... C. G. Richardson  
Chuck. Scroll..... J. C. Potter et al  
Cigarette. Oval..... G. P. Butler  
Cithern..... C. T. Menze  
Cloth unrolling machine..... J. E. Windle  
Clothes line prop..... W. B. Barbour et al  
Clutch mechanism. Friction..... P. H. Mack  
Clutch trip..... W. A. Murphy  
Cock. Blow off..... G. H. Truman  
Cock. Safety gas..... G. E. Blot  
Coin counting machine..... C. W. Johnson  
Coke. Manufacturing..... J. F. Wilcox  
Coke oven construction..... E. A. Moore  
Coke oven door..... E. A. Moore  
Coke oven door frame. Water cooled..... E. A. Moore  
Coke oven door. Water cooled..... E. A. Moore  
Coke oven foundation or substructure..... E. A. Moore  
Coke ovens. Means for protecting..... E. A. Moore  
Combustion of fuel..... R. Thomson  
Composite post..... A. B. Probasco  
Compound engine..... E. M. Coryell  
Condenser. Surface..... W. Hayner  
Conduit outlet box. Interior..... W. F. Bossert  
Controller..... J. B. Linn  
Conveyer..... J. B. Pitchford  
Copper and nickel from mattes or ores. Electrolytic separation of..... E. A. Sjostedt et al  
Corn husker and silker. Green..... A. M. Furrow  
Corset..... P. J. Menahan  
Corset shaper..... P. J. Menahan  
Coyote alarm..... J. S. Barnes  
Crate. Shipping..... G. L. Walburn  
Cultivators, &c. Balancing device for..... F. M. Dwight  
Curtain fixture..... L. C. Knott et al  
Curtain fixture..... H. H. Forsyth  
Curtain operating mechanism..... B. Leon  
Curtain pole..... E. S. Long  
Curtain securer..... J. J. Russell, Jr  
Cushion..... D. Hogan et al  
Cuspidor. Floor..... A. R. Candy  
Cutlery polishing machine..... W. T. Queen  
Dash pot..... W. C. Beauvais  
Desk and seat attachment. School..... J. H. Foster  
Dipper holder..... H. L. Beaman  
Dish drainer..... F. Cleek  
Display rack..... W. N. Wilbanks  
Dish washing machine..... C. H. Blanchard  
Ditching machine..... J. A. Fox  
Dolly bar..... J. Macbeth et al  
Domestic boiler..... M. Flynn  
Door check..... H. B. Handley  
Door equalizing device..... F. W. Tobey  
Door hanger..... A. E. Randle  
Draft equalizer..... S. A. Bates  
Drainage system..... B. F. Suddath  
Drawing parallel lines. Apparatus for..... E. Moller  
Dredge cutter..... L. W. Bates  
Dredge cutter. Suction..... L. W. Bates  
Dredger..... S. Beer  
Drilling apparatus..... J. C. Swan  
Drilling machine. Automatic..... J. W. Brown, Jr  
Drills, &c. Device for extracting..... C. A. Horan  
Drum..... J. Hennl  
Dump cantaliver..... J. P. Gallagher  
Dye. Black azo..... M. Kahn  
Dyeing..... M. Kahn  
Dynamos. Automatic potential regulator for..... A. A. Tirrill  
Eccentric. Movable..... W. T. James  
Electric current shunting device..... E. R. Cliff  
Electric lighter..... W. Roche  
Electric meter..... F. Holden



# THE INVENTIVE AGE.

Electric motor or engine..... J. Massey  
Electric time controller..... J. Weatherby, Jr  
Electrical distribution system..... N. Kowe  
Electrical resistance device or heater.....  
..... J. F. Bolling  
Electrode. Cataphoric..... S. H. Linn  
Electromagnetic brake..... F. C. Newell  
Elevator safety appliance..... S. B. Trapp  
Elevator shaft door lock..... J. E. Boyce et al  
End gate fastener..... W. R. Dunkel  
Engine..... W. A. Alsterlund  
Engine fuel feed regulator. Explosive.....  
..... C. A. Miller  
Engraving machine. Pantograph..... M. Barr  
Envelop..... A. E. Patterson  
Eraser. Combination..... E. M. Wilson  
Exercising and amusement apparatus. Child's.....  
..... P. F. Chase  
Exercising apparatus..... C. H. Roche  
Exercising apparatus..... J. E. Nightingale  
Explosion engine..... L. F. Splitt  
Explosive engine..... A. Krastin  
Eyeglasses..... L. F. Adt  
Fabrics. Producing perforated or open work  
patterns in..... C. Casanovas y Amat  
Fan..... L. D. Neke  
Fastener..... C. H. Goodwin  
Faucet. Lock..... J. F. Cunningham  
Feed mechanism..... C. E. Rhoades  
Feed regulator for steam boilers. Automatic  
water..... G. Weant  
Feeder. Boiler..... L. E. Hoffman  
Fence gate. Wire..... H. F. Alverson  
Fence machine. Wire..... C. A. Forsberg  
Fertilizer drying machine..... W. T. Urie  
Fifth wheel..... F. M. Freeburg  
Finger nail clipper..... J. C. Ernst  
Fire door. Automatic..... O. C. Donecker et al  
Fire escape. Pneumatic..... I. Hogeland  
Fire kindlers. Manufacture of..... E. C. Sachse  
Fire or shipwreck. Apparatus for saving life  
from..... F. E. Newsam  
Firearm. Automatic..... A. H. Stow  
Fish bait. Artificial..... 2 pats..... T. A. Bryan  
Fish mezzo rilievo..... J. W. Nash  
Fish trap..... J. E. Hill  
Flag pole holder..... W. H. Becroft  
Floor and wall ventilator and register.....  
..... J. H. Mills  
Floor, roof, &c..... P. H. Jackson  
Flour manufacturing apparatus..... L. Korab  
Flue cutter..... A. N. Lucas et al  
Fly screen..... S. C. Daniel  
Fuel feeding apparatus..... C. Wegener  
Furnace..... R. Thomson  
Gage..... A. Kuhlmann  
Game apparatus..... F. F. Honeck  
Game board..... H. Busch et al  
Game board. King ring..... C. J. Dorsey  
Game. Card..... R. W. Test et al  
Garment. Combination outer..... F. Wilcomb  
Garment hanger..... E. C. Cullum  
Gas burner. Incandescent..... J. H. Findlay  
Gas generating apparatus. Acetylene C. Busch  
Gasket making and inserting machine.....  
..... R. A. Hall  
Gate..... D. Warner  
Gate..... J. Granger  
Gear. Reversible and variable friction.....  
..... W. G. Gaum  
Gearing. Variable speed..... W. S. Austin  
Glass blowing machine..... W. S. Teeple et al  
Glass press..... S. McCaughy  
Gold, &c. Apparatus for the treatment of.....  
..... W. B. McPherson  
Gold. Extracting..... M. V. Uslar et al  
Governing fluid pressure impulse motor. Ap-  
paratus for..... J. W. Macfarlane  
Governing mechanism. Gas engine.....  
..... L. F. Burger  
Governing mechanism. Speed..... L. F. Burger  
Graphophone, phonograph, &c..... W. C. Runge  
Grate..... B. McCaughy  
Grate. Shaking..... A. B. Marshall et al  
Gravity motor..... J. R. Wright  
Gun. Gopher..... C. Sims  
Gun locking device..... A. F. O. von Aueged  
Hair or wool cutting or shearing machine.....  
..... H. Austin  
Harness oiling apparatus..... L. Dare  
Harvesting machine..... N. P. Djunkofsky  
Harvesting machine. Corn..... V. R. McDole et al  
Hat fastener..... T. Fries  
Hat pin. Lady's..... W. H. Lyon et al  
Headlight. Electric..... J. A. Mosher  
Heater..... T. E. Grover et al  
Heating furnace. Continuous..... A. Laughlin et al  
Heating system..... G. H. Jennings  
Hinge..... R. W. Hubbard  
Hinge and check. Combined door..... J. W. Morris  
Hook and eye..... L. N. Bedford  
Horse blanket..... M. Cleaver  
Horseshoe..... J. Marion  
Horseshoe..... G. H. Stone  
Horseshoe..... F. Herzog  
Horseshoe..... O. W. Siebenhaar  
Horseshoe finishing die..... A. Nisbett et al  
Hose clamp..... G. Meiner  
Hose coupling..... L. Lehotzky  
Hub. Sheet metal..... J. Macphail  
Hub. Vehicle wheel..... G. A. Schacht  
Human treatment apparatus..... 2 pats.....  
..... I. J. Hartford  
Hydrated silicates. Reviving..... C. A. McKerraw  
Hydrocarbon burner..... T. O. Bateman  
Hydrocarbon vapor burner..... W. H. Tarmon et al  
Illuminating device..... M. Mancha  
Inhaler..... A. Bulling  
Inhaler. Tubular..... H. Ferre  
Inkstand..... G. J. Sengbusch  
Inkstand. Fountain..... J. D. Barry  
Ink well..... G. J. Sengbusch  
Inscriber..... R. H. Smith  
Internal combustion engine..... A. L. Riker  
Jack lock..... J. J. Heys  
Journal box. Self-lubricating..... J. F. Smith, Jr  
Knitting machine..... G. D. Mayo  
Knitting machine needle..... E. A. Hirner  
Knitting machine. Straight fashioning.....  
..... C. H. Aldridge  
Knitting machine thread feeding mechanism.....  
..... G. D. Mayo  
Ladder. Store service..... W. T. Henning et al  
Lamp and circuits and conductors therefor.  
Electric incandescent..... G. Weissman  
Lamp bracket..... G. W. Weidner  
Lamp burner. Vapor incandescent.....  
..... S. M. Meyer  
Lamp filling indicator..... E. A. Burlingame

Lamp glower and attaching terminal wires  
thereto. Electric..... M. W. Hanks  
Lamp jack circuit arrangement.....  
..... H. P. Clausen  
Lasting machine..... T. H. McAuliffe et al  
Lathe back rest. Turret..... C. G. Richardson  
Lathe center. Ball bearing..... I. H. Gilman  
Lay rocker shaft box or bearing..... S. H. Bevil  
Lead socrate. Making..... A. Wohl  
Lemon squeezer..... J. Kress  
Lifting device..... H. F. Beeman  
Light effects. System for operating.....  
..... R. F. Spangenberg  
Linotype machine..... C. Muehleisen  
Linotype machine..... S. J. Briden  
Liquids. Apparatus for purifying, sterilizing,  
or aging..... R. C. Turner  
Lithographing and printing roller.....  
..... A. W. Kling  
Loom filling replenishing mechanism..... E. S. Stimpson  
Loom reed..... K. F. Weissbach  
Loom shuttle tension device..... A. Baldwin  
Luggage carrier..... S. Jacobson  
Magnet for alternating current generators.  
Rotating field..... H. G. Reist  
Marking implement..... G. A. McAlphine  
Mash in mash tubs. Arrangement for heating,  
cooling, and mixing the..... G. Ullrich  
Massage instrument..... C. Owens  
Match box..... J. W. Bunch  
Match case or holder..... F. J. Stone  
Measuring and sampling machine. Combined  
..... H. S. Badger  
Measuring device..... E. Smith  
Measuring ribbon, &c. Machine for..... B. Kohn  
Meat. Curing tube for pickling..... J. J. Bailey  
Mechanical movement..... E. A. Maingnet  
Mechanical movement..... C. J. Wennas  
Melting furnace..... J. F. Cottrell  
Mercury salts of ethylenediamin bases and  
making same..... G. Wichmann et al  
Metal planer attachment..... L. E. Ward  
Metal seat. Pressed..... R. T. J. Martin  
Metallic tie and rail fastener..... J. A. Boughton  
Metering. Multiple rate..... E. Thomson et al  
Micrometer. Inside..... L. S. Starrett  
Milk, &c. Apparatus for clarifying and aerat-  
ing..... J. L. Bergh  
Mining column bar..... A. Johnson  
Mixing and bleaching engine..... A. Rommney  
Motors. Controlling induction..... H. P. Davis  
Moving machine..... E. B. Fisk  
Multiple rate meter..... E. Thomson et al  
Music box indicating device..... G. A. Brachhausen  
Musical and pneumatic devices. Bellows for.....  
..... W. F. Cooper  
Musical instrument bellows..... M. Clark  
Musical instrument. Mechanical..... C. L. Davis  
Net. Minnow..... S. W. Higgins  
Nipple. Nursing bottle rubber..... W. F. Ware  
Nut wrench..... H. E. Andrew  
Oil burner..... M. C. Henley  
Oil burner..... J. W. Sievert  
Oil heater and vaporizer..... J. McDermott  
Oil or gas engine. Hydrocarbon..... E. W. Graef  
Oil tank..... E. E. Collins  
Ores. Desulfurizing sulfid..... reissue.....  
..... A. D. Carmichael  
Oxidizing textile material. Apparatus for.....  
..... C. E. Wild  
Packing case sides. Machine for making.....  
..... F. P. Cheney  
Paper bag holder and printer..... R. D. Simpson  
Paper or leather glassing machine..... S. E. Dart  
Pawl..... I. W. Doeg  
Photographic exposure meter..... A. Watkins  
Photographic printing apparatus..... A. Jaray  
Piano players. Striking mechanism for auto-  
matic..... W. F. Cooper  
Piano string bridge bearing..... F. Schimmel  
Pipe clamp. Inside..... B. W. Masterson  
Plaiting or braiding machine..... E. L. Thorp  
Plaster. Corn..... L. P. Graham  
Planter wheel..... N. Nilson  
Plastic compound..... O. T. Hungerford  
Plate. Pie or cake..... J. A. Bennett  
Plow..... N. A. Freeman  
Plow and cultivator..... J. D. Kelley  
Plumber's clamp for wiping joints..... C. Riley  
Pneumatic carrier..... C. H. Burton  
Pneumatic carrier..... O. S. Pike  
Pneumatic despatch apparatus. Automatic.....  
switch for..... F. C. Cutting  
Pneumatic despatch tube carriers. Lock for.....  
..... W. Blanchard  
Pneumatic tube apparatus terminal..... J. T. Cowley  
Pneumatic tube safety valve..... A. Koenig  
Pole socket..... B. D. Druen  
Pole tip. Vehicle..... E. L. Lewis et al  
Post protector..... J. Beazley  
Postal card..... A. Hoffmann  
Pouch..... J. A. Smithline  
Power translating device..... G. W. Marble  
Printing cliches and high reliefs. Producing  
..... J. Schmidting  
Printing press bed movement..... W. S. Huson  
Printing press delivery mechanism..... C. G. Harris  
Printing press tympan gage adjusting and  
squaring device..... P. W. Wiley  
Projectiles. Manufacturing..... G. H. Newell et al  
Propeller weed cutter. Launch..... L. M. Miller  
Pulp distributor and feeder..... L. Cohen et al  
Pulp vessels. Apparatus for making.....  
..... F. B. Howard  
Pump. Feed..... E. Josse  
Pump. High speed..... D. Banki  
Pump. Motor..... D. Banki  
Pump. Rotary..... W. S. Sharpneck  
Purse, &c..... A. Irons  
Quick acting wrench..... H. Aue  
Rail block..... W. H. Arthur  
Rail joint..... J. H. Fowler  
Rail joint..... P. Holbrook  
Rail joint..... G. H. Gray  
Rail joint..... A. Hauptmann  
Railway rail bridge rod..... J. R. Johnson  
Railway signal system..... J. P. Coleman  
Railway switch..... C. F. Granger  
Railway switch..... S. S. Nichol  
Railway system. Aerial..... L. A. Gross  
Railway tie..... E. McConnell  
Railway tie..... W. C. Kirkland  
Railway vehicle coupling. Automatic B. April  
Railways. Mechanism for cutting, crushing,  
and dislodging ice or sleet on the third rail  
of electric..... H. Klein

Railway wagons, &c. Construction of under-  
frames for..... P. Grant  
Refrigerating apparatus..... C. J. Coleman  
Refrigeration system..... 2 pass..... C. J. Coleman  
Refrigerator car ventilator..... W. E. Sharp  
Refrigerator door..... A. L. Shanklin et al  
Regulator..... J. B. Foote  
Rein fender..... J. H. Nienstadt  
Reversing mechanism..... L. E. Robinson  
Road, &c..... F. J. Nash  
Rotary engine..... L. M. A. Butin  
Rotary engine..... H. L. Lewis  
Sad iron. Gas heating..... H. W. O'Dowd  
Salt packing apparatus..... T. Courtland  
Sand cutting, sifting, lump crushing, and mix-  
ing machine..... N. K. Skow  
Sash fastener..... J. Bohlen  
Sash securing device. Outside..... W. M. Reely  
Satchel. Music..... R. E. Trognitz  
Saw level..... J. Bertrand  
Sawmill. Portable..... W. L. Hunt  
Scale..... J. H. Carr  
Scale. Automatic computing and weighing.....  
..... T. S. Mount  
Screen for windows, doors, &c..... F. C. Wright  
Screw mechanism..... W. L. Schellenbach  
Scribbling and carding machine..... S. Garsed et al  
Seal. Bottle..... F. A. Emerick  
Seal. Pressure resisting..... D. Craig  
Sealer. Envelop..... H. I. Talley  
Seeding machine..... E. Baseman  
Seine..... I. E. Palmer  
Separator..... J. Slaterry  
Sewing machine needle threader..... H. B. Maynard  
Sewing machine presser foot..... D. L. Chandler  
Sewing machine transmitter. Electric motor.....  
..... J. Rosenberger  
Shade. Adjustable window..... J. T. Ta  
Shaft coupling..... M. Halfperny  
Shaft coupling..... G. Graham  
Shaft loop and buckle. Combined C. E. Berry  
Shears, scissors, &c. Joint for A. F. Johns et al  
Shelving system..... J. Harrison  
Ships. Device for indicating position of sunken.....  
..... A. Tomic  
Shoe..... A. D. Puerner  
Shoe cleaner..... C. G. Strombeck  
Shovel..... W. N. Williams  
Sifter. Plan..... J. Konegen  
Sight testing apparatus..... F. W. Reich et al  
Siphon..... J. Fogg  
Sketching pad..... E. A. Chester  
Skylight operating device..... F. Reichard  
Smelting furnace..... E. F. Blessing  
Sound vibrations in water. Automatic means  
for producing..... A. J. Mundy  
Speed indicating and regulating apparatus.....  
..... A. Wetzel  
Seed mechanism..... J. S. Heath et al  
Seed mechanism. Variable..... F. J. Watt  
Speed regulator and stop mechanism.....  
..... T. H. MacDonald  
Spike extractor..... E. E. Welsh  
Spring coiling machine..... F. Kirk  
Springs in jointed members. Device for as-  
sembling..... J. A. Smithline  
Sprinkler apparatus..... A. A. Cowles  
Stave sawing machine..... P. Wineman  
Steam boiler..... C. M. Raymond et al  
Steam engine..... E. C. Doolittle  
Steam engine. Oscillating..... E. L. Street  
Steam generator..... C. A. Marnder  
Steam generator water level indicator.....  
..... H. Thiemann  
Steam trap..... L. B. Fulton  
Stone, bricks, &c. Apparatus for preparing  
composition for artificial..... L. P. Ford  
Store service apparatus..... 2 pats.....  
..... C. W. McCormick  
Stove and hot water heater. Combined cooking.....  
..... R. Purdy  
Stove. Gas..... E. E. Frederick  
Stove. Gas..... A. C. Witman  
Stove gas saving attachment..... S. W. Shoupe  
Strainer..... M. E. Gallaher  
Strainer. Down spout adjustable.....  
..... R. F. Coleman  
Street sweeper..... E. Curtiss  
Street sweeper..... A. Flechtheim  
Sulfite lyes. Utilizing..... V. Drewsen et al  
Sulfuric anhydrid. Making..... M. Le Blanc et al  
Suppository..... F. F. Feidler  
Suspenders. Boy's..... M. Goodman  
Switch operating mechanism..... C. E. Badger  
Talking machine case..... W. Barnes  
Tanks. storage bins, or warehouses. Wall for.....  
..... F. Kees  
Tanning hides, skins, &c..... O. P. Amend  
Taper making apparatus..... J. L. Harvey  
Tea. Obtaining extract of..... J. Roger et al  
Telephone receiver holder..... G. Konigstein  
Telephone switchboard spring jack.....  
..... C. E. Scribner  
Thermophoric mixture..... I. Timar  
Thill coupling..... N. Svenson  
Ticket holder..... C. F. Howes  
Ticket. Railway..... J. E. Mohan  
Tide water apparatus..... H. Smetana  
Tiles. Die for making roofing..... J. Daniel  
Tobacco pipe..... W. G. Hastings  
Tool. Combination..... G. L. Baker  
Tool. Pneumatic..... H. G. Kotten  
Tool. Pneumatic..... C. H. Haeseler  
Toy..... A. A. Fennessy  
Toy balloon..... A. J. Whisler  
Toy cap pistol..... W. J. Turnbull  
Trace fastener..... H. L. Hall  
Track sanding device..... T. E. Townsend  
Traction engine..... S. S. Morton  
Tray. Collapsible..... H. R. & R. S. Tuttle  
Trolley..... W. H. Bachtel  
Trolley pole..... C. A. Bray et al  
Trolley stand..... G. F. Johnson  
Trolley wheel..... F. P. Crockett et al  
Trolley wires. Safety device for automatically  
preventing accidents from..... W. A. & L. O. Heyes  
Trousers hanger..... W. Walker  
Truck..... T. W. Davis, Jr  
Truck..... R. L. Dorsey  
Trunk tray lift..... O. Rangnow  
Turbine..... J. Mercer  
Turbine. Compound..... R. Schulz  
Turbine. Duplex steam..... A. W. Case  
Turbine. Elastic fluid..... C. G. Curtis  
Twyer..... J. W. Miller et al  
Type machine matrix centering mechanism.....  
..... J. S. Bancroft  
Type writer..... W. F. Loyd

Type writer attachment..... W. E. Benson  
Type writing attachment..... W. E. Benson  
Type writing machine..... W. J. Barron  
Type writing machine individualized keyboard.....  
..... H. C. Statton  
Type writing machine inking mechanism.....  
..... R. W. Uhlig  
Valve and faucet coupling. Bushing.....  
..... 2 pats..... B. C. Anderson  
Valve. Engine..... F. H. Sleeper  
Valve for beer vats. Double acting.....  
..... J. H. Schmahli et al  
Valve for explosive engines. Vaporizing.....  
..... W. Readle  
Valve locking and operating device..... F. T. Whiteley  
Vehicle..... H. M. Pope  
Vehicle brake or lock..... L. Levin  
Vehicle coupling..... D. A. Dickinson  
Vehicle driving mechanism. Self propelled.....  
..... P. J. Collins  
Vehicle. Hand actuated..... E. C. Smith  
Vehicle. Motor..... C. W. Hunt  
Vehicle top..... G. W. Kernodle  
Vehicles. System of control for electrically  
propelled..... W. B. Potter  
Vending machine..... G. W. Peter  
Vessels in vacuum. Apparatus for closing.....  
..... E. G. Howe  
Vise. Machine tool..... B. Nadall  
Volt ampere meter..... L. M. Pignolet  
Voting machine..... A. McKenzie  
Wagon..... W. Maasch  
Wagon dumping mechanism..... J. Grundler  
Wardrobe hook..... W. A. Williamson  
Warping and beaming machine. Combined.....  
..... H. Van Winkle  
Washboard rubbing surface..... F. Martin, Jr  
Water boiler, skimmer, and oil separator.....  
..... W. H. Johnson  
Water controller. Automatic cistern.....  
..... A. P. Hummel  
Water heater..... J. Davie  
Water tube boiler..... D. Roberts  
Weeding tool..... A. P. Prevost  
Welding..... F. E. Canda  
Well drilling machine..... J. R. Lewis  
Wheel and casting same or other metal objects.....  
..... J. Slaterry  
Whiffletree hook..... J. E. Cooper  
Whiffletree hook..... A. R. Otterman  
Wicker work. Machine for making.....  
..... A. Pohorzeleck  
Windmill..... R. Decker  
Window screen..... M. Kolf  
Window screen..... F. Lind, Jr  
Wire and slat weaving machine..... W. C. Pratt  
Wire stretcher and clamp..... M. R. Barnhill  
Wire support. Coiled..... K. Dodge  
Wood, &c. Treating comminuted..... A. Classen  
Wringer..... G. D. Leedle  
Writing machine..... H. C. Hess  
X-ray tube..... T. Friedlander  
Yeast. Apparatus for the treatment of.....  
..... C. Hagenmuller

## DESIGNS.

Lamp shade..... 2 pats..... R. D. Chandler  
Spoons, forks, &c. Handle..... S. A. Keller

Issued April 28, 1903.

## MECHANICAL PATENTS.

Acid. Manufacturing muriatic..... G. E. Hipp  
Adding machine..... A. H. Stanton  
Advertisement displaying apparatus.....  
..... W. Britain, Jr  
Advertising system..... J. S. Mather  
Aerial apparatus..... A. W. La France et al  
Agricultural implement..... R. E. Clarke  
Air brake graduating release appliance.....  
..... E. G. Shortt  
Air brake mechanism..... T. J. Quirk  
Air under pressure. Apparatus for delivering.....  
..... H. Davis  
Alloy..... W. G. Stevens  
Animal trap..... S. Robinson  
Apparel..... N. F. Hurdell  
Awning support..... J. Springard  
Bag filling machine..... C. A. Fisher  
Bag holder for grain chutes, &c..... C. L. Squire  
Baling press..... J. W. Hamilton  
Baling press..... M. B. Jones  
Banana shipping case..... F. Schmitz  
Band hook and blank therefor..... J. B. Robinson  
Bathing scandal, slipper, &c..... J. S. Smith  
Battery charging device. Storage..... H. Lemp  
Bearing. Hub..... I. Metzger  
Bearing. Shaft or journal..... W. A. Hoyt  
Beating engine..... M. A. Mills  
Bed corner fastener..... M. F. Maddox  
Bed. Hospital..... J. R. Smith  
Bed. Portable..... W. J. Curry  
Bedstead attachment..... E. J. Barcalo  
Bedstead canopy support. Turnback.....  
..... I. E. Palmer  
Beer finishing apparatus..... J. F. Whittemann  
Bell attachment and burglar alarm. Door.....  
..... E. Snedeker  
Belt ends. Joining woven..... O. E. Geisel  
Bicycle canoy..... M. Zech  
Billet heating furnace..... E. H. Carroll  
Binder. Temporary..... F. B. Towne  
Boat. Submarine..... S. Lake  
Bobbin or cop builders. Yarn guide controll-  
ing mechanism for..... P. Purcell  
Boiler..... H. B. Hemphill  
Boiler brace. Steam..... W. E. Niles  
Boiler cleaner and water purifier..... J. A. Ray  
Boiler fire box..... C. Vanderbilt  
Boiler system. Flash..... A. F. Macdonald  
Boilers. Fusible plug for steam..... J. Philp  
Bolting sieve cloths. Device for cleaning.....  
..... J. C. Mann  
Book. Electric light and power station account.....  
..... W. E. Jenkins  
Book leaf holder and marker..... B. S. Gorbey  
Boot or shoe jack..... H. Perry  
Boring and reaming machine..... G. A. Ensign  
Bottle..... P. C. Traver  
Bottle capsules. Machine for the manufacture  
of..... W. Langbein  
Bottle for containing sauce, condiments, etc.....  
..... L. A. Calhoun  
Bottle. Non-refillable..... L. C. Edwards  
Bottle. Non-refillable..... G. Aurnamer  
Bottle stopper. Paste or mucilage..... A. Merri



Bottle stoppering apparatus..... S. Burkman  
Bottles, jars, &c. Cap or closure for..... E. Norton  
Boxes. Machine for making shooks for..... H. W. Morgan  
Brake shoe. Railway..... J. Player  
Bread and making same. Malted..... R. Graham  
Bridge guard..... J. S. Richardson  
Brush..... M. M. Lahue  
Brush..... D. F. Maher  
Brush..... W. A. Mills  
Brush. Scrubbing..... M. B. Tate  
Buckle..... A. W. Kruebling  
Buckle. Belt..... F. Dodge  
Burglar alarm system..... E. T. Holmes  
Butter treating compound..... G. W. Nelson  
Button..... G. W. Brown  
Button and button fastening..... G. W. McGill  
Button. Collar..... 2 pats. M. H. Mallory  
Calculating machine..... F. C. Rinsche  
Calipers..... F. A. Hatch  
Camera..... C. W. Schober  
Camera. Panoramic photographic..... J. E. Lenahan  
Can ending machine..... L. Lambin  
Canals, docks, or other hydraulic works. Apparatus for controlling flow of water from river &c., to..... C. E. Livesey  
Car..... J. H. Fassett et al  
Car construction. Steel..... A. B. Bellows  
Car coupling centering device..... reissue  
Car door operating gear. Coal or coke..... E. F. Chaffee  
Car fender..... W. F. Kiesel, Jr  
Car mover. Portable..... F. D. Roper  
Carbon black. Apparatus for the manufacture of..... F. W. Porsch  
Carding engine. Traveling flat W. Batten et al  
Carriage escapement. Dog..... C. B. Yaw  
Carrier apron..... C. Colahan  
Carton making machine..... E. C. Lovell  
Cartridge. Blank..... O. Schutte  
Carving tool..... A. Deaton  
Caster..... H. McDonnell  
Cement and gravel separator..... J. Behm  
Centrifugal drier..... M. O. Kasson  
Chair. Drive..... Z. T. Furbish  
Chopping knife..... T. J. Lavender  
Church. Drill..... E. C. Wysong  
Churn..... W. B. Preston  
Cigar wrapper cutting machine..... F. E. Kelsey  
Cinder guard..... S. F. B. Morse et al  
Clipping machine. Electric..... J. Cornu  
Clock..... E. Fitch  
Clothes drier. Folding..... G. Church  
Clothes drying attachment. Steam radiator..... S. L. Richardson  
Clothes line prop..... E. J. Prest  
Clothes line reel..... J. McKee  
Clothes wringer gear casing..... J. W. Nowak  
Clutch. Friction..... W. A. Young  
Clutch. Friction..... M. R. Conway  
Coffee making machine..... L. Bezzer  
Coffee. Manufacturing..... W. E. Baker  
Coffee or tea pot..... E. Wilkinson  
Coffee. Roasting..... L. Giacomini  
Coffee roasting apparatus..... L. Giacomini  
Coil heating furnace..... C. Mercader  
Coin freed mechanism..... W. J. Wilson  
Color plates, &c. Holding and registering hook for..... O. H. Quetsch  
Comb..... E. B. Kingman  
Commode..... J. N. McGrew  
Composition of matter..... E. P. Smith  
Composition of matter. Making..... E. P. Smith  
Conveyer..... J. Harmon  
Cooking apparatus. Electrical..... J. I. Ayer  
Cork extractor..... R. T. Fetrow  
Corking apparatus..... E. Berliner  
Corn carver..... A. M. Furrow  
Coupling pin..... J. F. Schweigerer  
Crate. Folding poultry..... A. McDonald  
Cream separator. Centrifugal..... O. Anderson  
Crusher and pulverizer..... M. F. Williams  
Cultivator..... L. E. Waterman  
Curtain pole tip fastener..... C. B. Dawes  
Curtain stretcher..... J. F. Koepf  
Cuspidor collector and carrier..... J. P. Johnson  
Dental bridgework..... V. von Unruh  
Depurator..... C. E. H. Armbruster  
Dispensing cabinet..... L. E. Campbell et al  
Door check..... G. J. Connor  
Door equalizer..... V. P. De Knight  
Door holder..... T. W. Brittingham  
Dough mixing and kneading machine..... G. T. Allen et al  
Draft appliance..... S. H. Tinsman  
Draft appliance. Detachable..... M. Segal  
Draft equalizer..... W. W. Laincor  
Draft equalizer. Three horse..... O. E. Abbey  
Draw bar..... C. E. Rhoads  
Dredging bucket..... R. W. Christian  
Dress shield..... F. A. Schultz  
Drill bit..... W. H. Clark et al  
Drum rack. Portable..... J. W. Pepper  
Dye and making same. Blue basic..... E. A. Fourneaux  
Dye. Black azo..... M. Kahn  
Egg or fruit box..... H. C. Sumpter  
Egg preserving compound..... J. M. Brooks  
Electric circuit..... E. F. Northrup  
Electric circuit controlling mechanism..... G. A. Tate  
Electric control mechanism..... E. Thomson  
Electric currents. Apparatus for the generation and direct electrolytic application of..... F. E. Elmore  
Electric cut out..... L. J. Mulvaney  
Electric furnace..... E. A. Sjostedt  
Electric track circuit and insulating same..... E. A. Everett  
Electric wire support..... B. Cullen  
Electrical and selective distribution..... 2 pats. J. S. Stone  
Electrodes. Forming accumulator..... G. J. Scott  
Elevator electrical control..... J. D. Ihlder  
Elevator safety device..... J. Drum et al  
Elevator safety device. Electric..... A. Sundh  
Elevators. Automatic control system for..... B. N. Jones  
Embroidery seam..... C. E. Bentley  
Engine reversing mechanism..... C. E. Mack  
Engine vaporizer. Explosive..... G. A. Gemmer  
Engines. Means for regulating the pressure in evaporators of cold vapor..... E. Josse  
Envelope. Safety..... E. C. Thumbe  
Eyeglasses..... O. Gillette  
Fabrics. Thread and cord edge finish for..... H. A. Klemm  
Farm gate..... A. B. Blyholder

Fan sticks to fan tops. Machine for fastening..... L. E. Elson  
Faucet. Three way..... D. W. Dinneen  
Feed controller. Automatic boiler..... F. X. Brunelle  
Feed water heater and purifier..... J. Beha  
Feed water regulator..... W. H. Berry  
Feeder. Automatic boiler..... S. Basch  
Feeding mechanism..... C. W. Gay  
Fence post. Cement..... L. A. Pratt  
Fence tool. Wire..... A. W. Post  
Fender fastening..... A. D. Ray  
File. Card..... C. Keck  
File. Card or check..... J. W. Hine  
File. Letter..... C. Keck  
Filling machine..... F. M. Peters  
Filter. Beer..... W. Haussermann  
Filter. Water..... T. Linke  
Filtering..... O. H. & W. M. Jewell  
Fire escape..... J. Yost  
Fire escape..... B. Tenenbom  
Fire escape..... E. P. Le Compte  
Firearm. Gas operated..... A. Burgess  
Firearm holster..... R. M. G. Phillips  
Fish hooks. Combined card and book for holding..... A. W. Connor  
Fish plate..... C. H. Riggie  
Fishing reel..... J. Dreiser  
Flower pot..... W. Schaefer  
Fluid under pressure. Means or appliance for transmitting..... S. H. Brooks  
Fume gate rubbish diverter..... J. F. Peirce  
Fly trap..... J. W. Williamson  
Folding machine..... L. E. Elson  
Folding table..... J. E. Turner  
Fruit grader..... C. Rayburn  
Fuel feeding mechanism..... C. I. Filson  
Furnace..... H. H. Huff  
Furnace..... R. S. Thompson  
Furniture fastening device..... W. E. Nelson  
Fuse box..... E. A. Wilson  
Game..... C. Williamson  
Game apparatus..... M. A. Davies  
Game apparatus..... J. Brinkmann  
Garment holder and supporter..... C. O. Barnes  
Garment retainer..... 2 pats. M. H. Mallory  
Garment support..... F. M. Patterson  
Gas and air mixer..... D. J. Archer  
Gas burner. Safety..... H. W. Yerrington  
Gas check..... G. A. Brachhausen  
Gas engine..... W. J. McVicker  
Gas generator..... C. W. Turner  
Gas or explosive engine..... L. A. C. Letombe  
Gas or oil shut off. Automatic..... C. Fox et al  
Gas or vapor burner valve..... J. A. & A. H. Bedworth  
Gas producer..... J. Reuleaux  
Gas. Treating fermentation J. F. Wittemann  
Gate..... F. E. Williams et al  
Gate..... C. C. Hunt  
Gate fastener. Frameless wire S. P. McCaslin  
Gear. Self adjusting friction G. T. Rennerfelt  
Gear. Speed..... S. Diamant  
Gearing..... J. R. Nye  
Gem cutting and polishing machine..... G. Purper et al  
Glass. Means for manufacturing sheet..... A. G. Hamm  
Glove form..... A. Foulds  
Gluing machine. Blank..... P. S. Smith  
Gold from ores. Extracting..... F. J. Hoyt  
Golf ball..... F. W. Smith, Jr  
Golf ball..... 3 pats. G. Browning et al  
Goose call..... D. S. Fuller  
Governor. Marine engine..... P. V. Cornils  
Grain binder..... C. Colahan  
Grain drier and cooler..... C. F. Verrell  
Grapple..... P. Rasmussen  
Grave protector..... F. Sklenske  
Grease cup..... J. F. Lewis  
Grinding or polishing machine..... E. Cramer  
Gumming machine..... H. D. Sisson  
Gun attachment. Magazine..... P. M. Offutt  
Gun. Magazine bolt..... C. C. Brooks  
Guns. Constructing..... A. H. Emery  
Guns. Device for regulating the recoil and counter recoil of..... K. Haussner  
Hammer..... G. H. Rowe  
Harness attachment. Team..... F. L. Ainsworth  
Harrow..... G. Sloan  
Harvester wheat shocking attachment. Self binding..... C. B. Cummons  
Harvesting machine. Corn..... P. P. Coler  
Hat fastener..... W. A. Callanan  
Hat rack..... G. C. Hager  
Hay carrier..... W. Louden  
Hay loader wind shield..... G. A. Peterson  
Hay rake. Horse..... G. Wilson  
Head gate..... J. H. Buttorff  
Heating systems. Automatic controlling device for steam..... J. H. Davis  
Heel. Boot or shoe cushion..... J. Coffman et al  
Heel. Cushion..... H. F. Rooney  
Heel rand cutting and counting machine..... C. O. Rybery  
Hertzian waves. Transmitting and receiving apparatus for..... E. Ducretet  
Hides or skins. Machine for treating..... A. F. Jones  
Hinge. Separable..... G. H. Schiek  
Horn support. Amplifying..... A. S. Marten  
Horseshoe. Rubber..... J. J. Collieran  
Horses. Device for administering medicine to..... J. L. Reid  
Hose. Device for winding metallic spiral..... E. Wizenmann et al  
Hose. Wire covered..... J. F. McGuire  
Hosiery..... N. F. Hurdell  
Hub and axle bearing..... A. J. Theiring  
Hub attaching device..... W. D. Walker  
Hydraulic press speed governor..... H. Harmer  
Index card..... G. P. Knapp  
Indigo mixture and making same..... B. Homolka  
Injector..... S. F. Siple  
Insulating material..... W. R. Whitney  
Jack..... A. Stromdahl  
Jar closure..... W. E. Brown  
Journal bearings. Mold for brass..... F. J. Friese et al  
Key ring..... N. B. Stone  
Kilns for burning. Apparatus for setting unburned ware in..... J. E. Minter  
Lace fastener. Shoe..... 2 pats. J. Hennessey  
Ladder. Extension..... W. P. Hartigan  
Lamp attachment..... E. J. Gilmore  
Lamp burner..... W. L. Bogle  
Lamp burner. Incandescent..... C. Hubert  
Lamp carbon holder. Electric arc..... H. P. Bayley  
Lamp chimney..... J. J. Perkins

Lamp for liquid fuel. Incandescent..... A. Poeffel  
Lamp. Incandescent gas..... W. Schaefer  
Lamp kerosene oil burner..... E. Humphrey  
Lamp support. Street..... P. W. Shute  
Lamps. Exhausting..... J. W. Howell  
Last..... C. F. Pym  
Lath..... B. M. W. Hanson  
Lathe. Last turning..... J. T. Brown  
Leather working machine..... H. F. Dougherty  
Letter box..... H. B. Lambert  
Letters for advertising boards. Movable..... T. Knoblich  
Level..... J. A. Traut  
Life preserver and swimming apparatus..... W. P. Tibbits  
Light transmitter..... F. W. Porsch  
Lighting. Fixture for vacuum tube..... D. M. Moore  
Linotype galley..... F. E. Milholland  
Linotype machine..... P. T. Dodge  
Liquid dispensing vessel..... L. G. Langstaff  
Liquid raising apparatus..... V. Schwaninger  
Liquid separator..... P. L. Kimball  
Lock..... H. G. Carleton  
Lock..... J. M. Owen  
Locking device..... C. F. Roper  
Locker..... D. Mayor, (now D. Churchill)  
Locomotive tank coal conveyer..... L. H. Lewis  
Log hauling and loading machine..... T. S. Miller et al  
Loom. Filling replenishing..... W. F. Draper  
Loom. Filling replenishing..... C. F. Roper  
Loom. Filling replenishing..... O. A. Sawyer  
Loom filling replenishing mechanism..... B. F. S. Austin  
Loom harness frame..... W. Fehr  
Loom shuttle controlling mechanism..... C. F. Roper  
Loom stopping mechanism..... E. S. Stimpson  
Magneto..... C. W. Holtzer  
Magnets to spiders. Fastening field..... H. G. Reist  
Mail chute..... J. G. Cutler  
Mandrel..... H. Prentice  
Manhole..... F. T. Moore  
Mat holder. Door..... S. F. Oliver  
Match box holder..... W. A. V. Porter  
Measuring instrument..... I. B. Hagan  
Metal treating furnace..... M. J. Murdoch  
Metallic tie and rail fastener..... J. H. Gallagher  
Microphone or microphone transmitter for electrical sound transmission..... F. W. Senkbeil  
Milk receptacle lock..... J. L. Farley  
Milling machine..... S. R. Boyer  
Mold flask. Extensible..... J. W. Hoefers  
Molder's flask pin..... W. J. Ball  
Molding apparatus..... C. M. Day  
Molding machine..... F. W. Hastings  
Molding machine..... A. L. & O. Anderson  
Mop wringer..... A. W. Jones  
Mop wringer and scrubbing pail. Combined..... J. Rosebush  
Motor controlling apparatus..... J. D. Ihlder  
Motor wheel..... J. A. Raud et al  
Mower. Lawn..... P. J. Tunny  
Mowers, &c. Cutting apparatus for..... T. O. Bailey  
Multiphase windings. Connecting..... W. S. Moody  
Multiphase windings. Means for connecting..... W. S. Moody  
Music recording machine..... G. E. Prince  
Music roll perforator..... E. B. & M. F. Gregor  
Musical instrument. Automatic..... E. de Kleist  
Needle for knitting, &c..... F. B. Reuther  
Net lifting machine..... S. A. Ross  
Nitrocellulose films or sheets. Manufacturing..... F. A. Anthony  
Nut lock..... T. F. O'Neil  
Odometer..... J. N. Leach  
Oil can. Non explosive..... T. J. Voorhies  
Ore treating process..... B. T. Nicholls  
Ores, &c. Apparatus for crushing and sorting..... E. Ferraris  
Ornament. Pendant..... H. S. Kerr  
Oven..... G. J. Schmid  
Package tying device..... D. A. Carpenter  
Packing. Metallic..... W. G. Watson  
Paper bag machine..... M. Haigh  
Paper coating machine..... C. E. W. Schumacher  
Paper cutting machine cutting beds. Mounting of..... B. F. De Costa  
Paper feeding machine..... G. R. Williams  
Paper jogger..... L. B. Taylor  
Pattern. Garment..... R. S. O'Loughlin et al  
Pen. Fountain..... J. Barnes  
Pen. Fountain..... C. Nichols et al  
Pencil. Lead..... C. von Schenitzky  
Pencil sharpener..... C. H. Williams  
Perforated bottom furnace..... P. Patterson  
Pessary..... L. Hering  
Photographic shutter..... J. S. Wright  
Photographic shutter..... M. Klaiber  
Piano attachment..... W. W. Saunders  
Picture exhibiting apparatus. Coin controlled..... J. C. F. Attasatt  
Pictures or designs upon enameled metal, &c. Imprinting and fixing colored..... C. J. Greenley et al  
Pigment and making same W. N. Blakeman Jr  
Pigments. Making..... W. J. Armbruster  
Pile driver..... F. A. von Eberstein  
Pile driver..... W. E. Sproul  
Pin light and generator..... T. W. Moran  
Pin holder..... C. F. & H. R. Brown  
Pine and producing same. Derivative of..... N. Thurlow  
Pipe coupling..... F. N. Smith  
Pipes, conduits, &c. Hanger for..... A. B. Caril  
Pliquet closer..... S. W. Long et al  
Plant support..... J. H. Broxey  
Planter attachment. Corn..... B. F. Gordon  
Plastic material. Machine for molding..... E. W. Stevens  
Pliers..... C. S. Bonner  
Plow. Ditching..... B. D. Lement  
Pole. Metallic..... W. Maxwell  
Potato digger..... F. Heinrich  
Potato digger..... F. G. Lilly  
Power transmitting device..... I. Deutsch  
Printer. Check..... F. Mutschler  
Printing press files. Jogger for..... J. Kaup  
Projectile..... L. P. Holmblad  
Pulp guard. Beating engine..... H. A. Hall  
Pump..... W. B. Culver  
Pump. Duplex force..... E. B. Croyp  
Pump. Rotary eccentric piston..... M. Linnell  
Punch attachment. Ticket..... H. C. Watson

Race track amusement apparatus..... W. H. Gilman  
Rail contact shoe and support therefor..... L. Wheeler et al  
Railway crossing gate..... B. A. Karr  
Railway gate signal..... E. Stevens et al  
Railway rail..... J. P. A. Hanlon  
Railway rail fastener..... W. N. Haring  
Railway rail fastening..... R. G. Musgrove  
Railway safety device..... S. Rogozea  
Railway signaling device..... E. M. Cutting  
Railway third rail guard. Electric..... J. Martin  
Railway wagon. Self discharging J. T. Jepson  
Railway wagons, &c. Coupling for..... R. F. C. Rambeaud  
Railways. Third rail support for under-running third rail electric..... L. Wheeler et al  
Razor strop swivel..... J. H. Keating  
Receptacle and packing ring therefor..... J. L. Mason  
Recording system. Electric..... J. C. Huss et al  
Refining engine..... S. R. Wagg  
Rifle. Magazine..... B. F. Perry  
Rock drill valve..... H. S. Burrell  
Rolling mill repeater..... E. E. Slick  
Rolling sheet or other metal strips or bars of curved or other section. Machinery for..... G. B. Johnson  
Root cutter..... O. Davis  
Rotary engine..... H. M. Hjermstad et al  
Rotary engine..... C. D. Holt  
Rotary explosive engine..... P. C. Sainsevain  
Rotary meter..... G. Fajen  
Running gear..... J. Weber  
Sad iron. Self heating..... H. D. Raemisch  
Saw..... W. O. Williams  
Saw gummer..... J. M. Birtels  
Saw gummer..... E. Chainey  
Sawing machine..... W. Goethe  
Sawmill set wheels. Grip mechanism for operating..... J. E. Queen  
Screw machine tool holder..... C. L. Goodrich  
Seal. Car..... T. White  
Sealing jars. Means for..... W. Walter  
Search light..... J. L. Hall  
Secondary battery..... P. Figuccia  
Seed packet holder..... J. L. Ullathorne  
Sewage. Plant for disposal of..... J. Danner  
Sewing machine. Buttonhole..... F. W. Ostrum  
Sewing machine loop spreader mechanism..... H. A. Klemm  
Sewing machine thread cutter..... R. L. Lyons  
Sewing machine tuck creaser and marker..... A. Merkel et al  
Shade or curtain pole holder..... G. Bell  
Shaft coupling..... A. J. Ott  
Shaft driving mechanism..... A. L. Cushman  
Shafts at variable speed by means of alternating current motors. Mechanism for driving..... O. Holz  
Shearing mechanism..... S. V. Huber  
Shears..... W. Welch  
Ship's table..... W. J. Preater  
Shoe cleaner..... W. G. Callender  
Shoe polishing stand..... R. G. Polson  
Silo..... J. P. Christensen  
Silo..... W. Craine  
Skate roller..... L. M. Richardson  
Skirt holding device..... E. W. Wheelock  
Skirts. Woven interlining for..... W. S. Cox  
Skiving machine..... F. L. Harmon  
Slicing knife..... W. Kelley  
Sole blocking machine..... F. O. Schryburt  
Sole. Boot or shoe..... E. Dimant  
Smoke consuming apparatus..... J. A. Holthaus  
Speculum. Rectal or vaginal O. H. Kohlhaas  
Spindle head and bearings therefor..... Z. R. Tucker  
Sprayer. Liquid..... L. A. Aspinwall  
Spring..... F. P. D'Arcy  
Stair rod and fastening therefor..... I. V. Mead et al  
Steam engine..... S. Hicks  
Stirrup..... J. Hollicott  
Stoker. Mechanical..... H. G. Cox  
Stone. Artificial..... T. K. Gainus  
Stone block. Mold for the manufacture of artificial..... L. P. Ford  
Stopper..... 2 pats. J. H. Rivers  
Stopping and reversing mechanism..... B. M. W. Hanson  
Storage battery..... F. A. Feldkamp  
Store service apparatus station..... 2 pats. W. L. Churchill  
Stove. Heating..... C. A. Richardson  
Strauer. Rotary..... C. Edgerton  
Street cleaning apparatus. Hydraulic..... P. Shannon  
Stump puller..... I. H. Garrett  
Stump puller or lifting machine..... C. Shoettle  
Suppository molding machine..... F. S. Chester  
Suspenders and belt. Combined..... A. Landau  
Suspenders spring attachment..... W. H. Edwards et al  
Switch..... A. Bouvier  
Switch..... J. L. Albize, Jr  
Switch connection. Adjustable F. C. Anderson  
Switch lock. Electrical..... C. A. Shea  
Switch regulator..... W. S. Moody  
Synchronous motion. Means for producing..... L. M. Potts  
Tandem compound engine..... S. M. Vauclain  
Tank..... 2 pats. G. H. Lloyd  
Tappet for stamp batteries, &c..... M. Bodley  
Teaching reading of the facial expression which occur in speaking. Means for..... L. E. Warren  
Telegraph system..... C. K. Jones  
Telegraph system. Printing..... W. P. Phelps  
Telegraphy. Synchronous code..... 2 pats. E. F. Northrup  
Telephone pad..... C. Van Riper  
Telephonic apparatus..... 2 pats. F. W. Wood  
Thermometer. Clinical..... O. G. Bell  
Thread holding and cutting device..... E. Flower  
Tide Motor..... P. J. Nevins  
Tile flooring..... C. P. Capen  
Tile. Illuminating..... P. H. Jackson  
Time recorder. Workman's..... C. E. Larrabee  
Tobacco. Apparatus for disentangling cut..... O. W. Allison  
Toe clip..... H. Stevens  
Tool. Combination..... L. Smith  
Tool. Fluid pressure operated..... C. H. Johnson  
Tool handle..... E. E. Hendrick  
Tooth caps. Core for casting molds for..... W. M. Sharp  
Tooth caps. Device for drawing metal..... W. M. Sharp  
Tooth crown. Seamless gold..... J. R. Comins  
Torpedo..... M. Fischhaber



Toy hoop.....W. E. Veideman  
 Toy Trick.....J. R. Armstrong  
 Toy wind wheel.....B. Sutton  
 Tread power motor.....E. Parker  
 Trolley wheel.....C. S. Stanton  
 Truck.....H. H. Colestock  
 Truck and bolster. Car.....W. A. Frazier  
 Trunk binder.....J. P. Wales  
 Trunk. Wardrobe.....N. Baruch  
 Tufting machine.....W. E. Buser  
 Tumbling apparatus.....G. A. Curtis  
 Tuning mechanism for stringed instruments.....A. Lang  
 Turbine. Steam.....T. G. E. Lindmark  
 Twyer. Blast furnace.....O. S. Garretson  
 Type writer cabinet.....F. W. Tobey  
 Type writer paper guide.....A. Swindlehurst  
 Type writing machine.....J. E. Neahr  
 Vacuum pan.....E. Passburg  
 Valve.....J. Rothchild  
 Valve. Automatic choke 2 pats.....F. W. Edwards  
 Valve float.....B. F. Lockwood  
 Valve. Gate.....O. B. Kaiser  
 Valve operating mechanism.....J. Bissing  
 Valve. Pressure regulating.....J. C. Schaefer  
 Valve. Rotary.....F. R. Pleasonton  
 Valve. Rotary cut off.....W. J. Francke  
 Valve. Steam.....H. Berg  
 Valved appliance.....J. J. Sullivan  
 Vehicle.....F. Stratton  
 Vehicle chafe iron. Antifriction.....C. E. Crofford  
 Vehicle. Motor.....H. Gilchrist  
 Vehicle mud guard. Wheeled.....C. W. Brown  
 Vehicle side dumping body.....W. L. Chessrown  
 Vehicle storm shield.....A. E. Metzger  
 Vehicle wheel.....F. Mesnard  
 Vending machine. Coin operated.....L. W. Baldwin  
 Veneer edging machine.....W. C. Calhoun et al  
 Vessel loading apparatus.....E. Holbrook  
 Voltages. Means for varying delta connected.....A. H. Armstrong et al  
 Voting apparatus for use with balls.....W. T. Odhner  
 Voting machine.....A. M. Spaulding  
 Wagon unloading device.....B. Limberg  
 Washboard.....C. Hardwick  
 Washing machine.....G. H. Rhodes  
 Water heater.....Z. E. Williamson  
 Weaner. Colt or calf.....B. Earl  
 Well inlet.....reissue.....D. H. Maury  
 Well tube.....E. P. Fox  
 Well tube perforator.....J. J. Brinkman  
 Wheat pitching machine.....W. H. Milton  
 Wheel tightener.....S. G. Klotz  
 Whiffletree.....D. L. Mayo  
 Windmill.....J. Tompkins  
 Window frame and sash.....W. & A. Shrivell  
 Wire netting machine.....C. J. Fox  
 Wire stretcher.....J. J. Fox  
 Wrapping machine.....T. Stebbins  
 Wrench.....N. B. Stone  
 Yoke. Neck.....C. Stadler  
 Zinc spelter refining apparatus.....T. Jones

## DESIGNS.

Register case. Hotel.....H. K. Greenman  
 Silverware, &. Mounting for.....C. A. Bennett  
 Spoons or similar articles. Handle for.....E. Crees et al  
 Stove or range. Cooking.....R. Thiem  
 Teapot.....A. F. Jackson  
 Trunk pad.....J. B. La Rock

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

Foreign patents may also be obtained in certain other countries.

## Perpetual Motion.

It is the corner stone of modern physics that perpetual motion, in the sense in which it was sought by the old philosophers, cannot exist. An unfailing original source of energy is a contradiction in terms, since energy can only be transferred, not created. This being true, physicists have lately been put at their wits' ends to explain the newly discovered phenomena of radio-activity, in which certain rare metals continuously give off rays much resembling the Rontgen radiation in their properties. The energy of this radiation is sufficient, estimated in heat units, to melt in a year's time a layer of ice one-sixtieth of an inch thick above the radiating area. This is not much, but, such as it is, it has been given off for millions of years without apparent change in the emitting substance. It can hardly be said that this phenomena has yet been satisfactorily accounted for. Some authorities believe that the energy of the radiation does not really come from the radiating substance, but is derived by it from outside in some way. Others think that there is an alteration in the active substance, so slight that it cannot be detected, and that in time the radiation will cease.—*Success.*

## Asbestos Insulating Paper a New Invention.

A new industry is being launched in the United States which is expected to prove as important in electrical development as was the Bessemer process in the world of steel. The company which has been formed to carry out the inventor's plans proposes to take asbestos as it comes from the ground in many parts of the world and by secret process abstract the iron and other foreign substances, leaving it absolutely pure. This, with paper fiber, is to be made into paper as thin as a fashionable woman's stationary. Burned, a pure asbestos paper remains, and this provides a perfect insulator. It is proposed to make the insulator in combination with rubber and other compounds of laminated pieces which can be molded into any shape or thickness required.—*Modern Machinery.*

**FREE!** Send us 2 cents to pay for postage and we will mail you a valuable copyrighted book, "How to obtain Patent, Caveat, Trade-Mark and Copyright Protection, with Decisions in Leading Patent Cases" entirely free of charge. Address: INVENTIVE AGE PUBLISHING COMPANY, (Dept. P.) WASHINGTON, D. C.

## Attention Inventors!

## LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

Charge, fifty cents to one dollar, depending on size of list.

In ordering, please state class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.

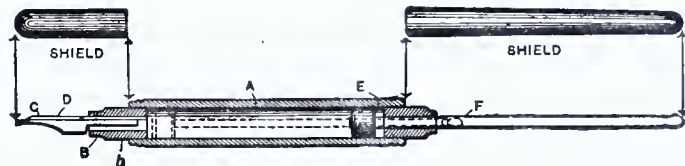


.....A Remarkable Offer.....

# The "POST" SELF FILLING CLEANING FOUNTAIN PEN.

NO FILLER. NO SOILED FINGERS. NO LOST TIME. SIMPLE AND PERFECT.

THIS IS ITS CONSTRUCTION.



It is away ahead of any other pen manufactured because of its self-filling and self-cleaning features. Being the only one manufactured having these conveniences.

We will send this famous pen, postpaid, and one years subscription to "The Inventive Age," for \$2.00.

Every Inventor in the country needs The INVENTIVE AGE, and every one needs a pen. Here's your chance to get a bargain.

There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the "POST" has secured. We have testimonials that a million dollars could not buy. In the list will be found leading men in politics, finance, law, religious movements, literary men, bankers and business men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the "Post" and in terms of praise simply unqualified. Send for list of testimonials.

Address: The Inventive Age, Publishing Co.  
 918 F St. N. W., Washington, D. C.

## Our Great Popular Offer!

....A....

## Complete Electrical Library

By PROF. T. O'CONOR SLOANE.

...A...

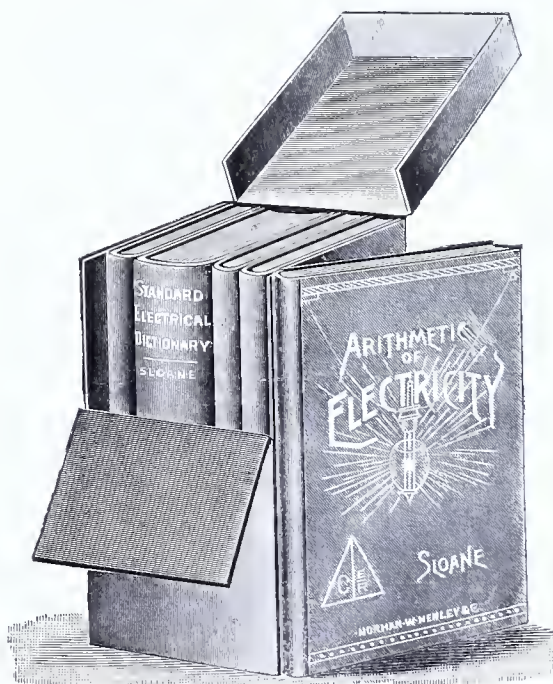
\$7.00

Library

for

\$5.50.

Comprised by  
 the following  
 books:



5 Volumes,

1300 Pages,

Over 450

Illustrations.

Electricity Simplified..... Price 1.00  
 Arithmetic of Electricity..... " 1.00  
 Electric Toy Making..... " 1.00  
 How to Become a Successful Electrician..... " 1.00  
 The Standard Electrical Dict'y..... 3.00

Our Great Special Offer.—We will send prepaid, the above five volumes, handsomely bound in blue cloth, with silver lettering, and enclosed in a neat folding box, as shown in the illustration, at the Special Reduced Price of \$5.50 for the complete set. The regular price of the five volumes is \$7.00.

Order direct from us while the opportunity lasts. Any of the above books sold singly at the published prices. You save \$1.50 by ordering the complete set from us. Sent prepaid on receipt of price. Remit by draft, postal money order, or express order.

Address: THE INVENTIVE AGE Pub. Co., 918 F Street, N. W., Washington, D. C.



# E. G. SIGGERS,

Solicitor of Patents and Counsellor in Patent Causes.

Twenty-three Years Active Practice.

Personal Service Guaranteed.

SEND YOUR BUSINESS DIRECT TO WASHINGTON.

SAVES TIME, COSTS LESS, BETTER SERVICE.

My office close to U. S. Patent Office.

See my rating in both Bradstreet's and Dun's reports.

Send model, drawing or photo with description for FREE preliminary examination and report as to Patentability.

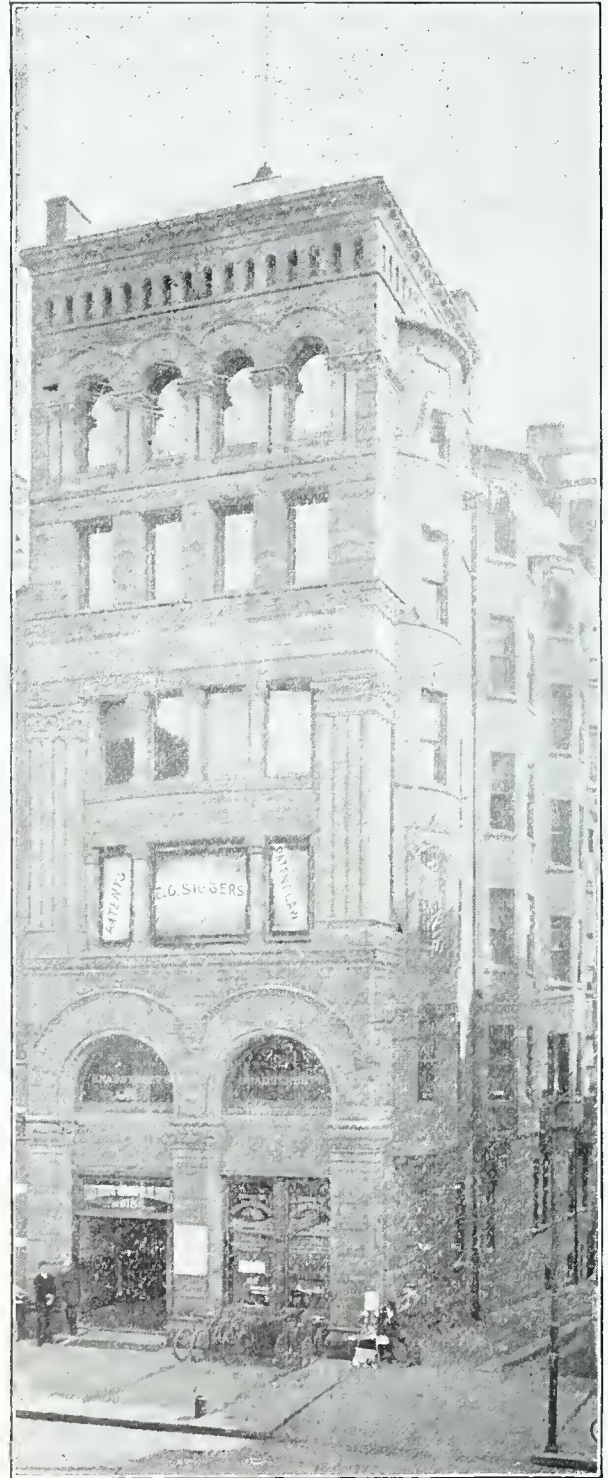
Send for free 48-page book on "How to Obtain Patent, Caveat, Trade-Mark and Copyright Protection with Decisions in Leading Patent Cases."

Patents procured through E. G. SIGGERS receive special notice WITHOUT CHARGE in the

## INVENTIVE AGE

an illustrated monthly now in its fifteenth year.

References furnished for every State of the Union.



Address: **E. G. SIGGERS,** Patent Lawyer,

National Union Building 918 F Street, N. W.,  
WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

*THE Inventive Age* AND  
PATENT INDEX.

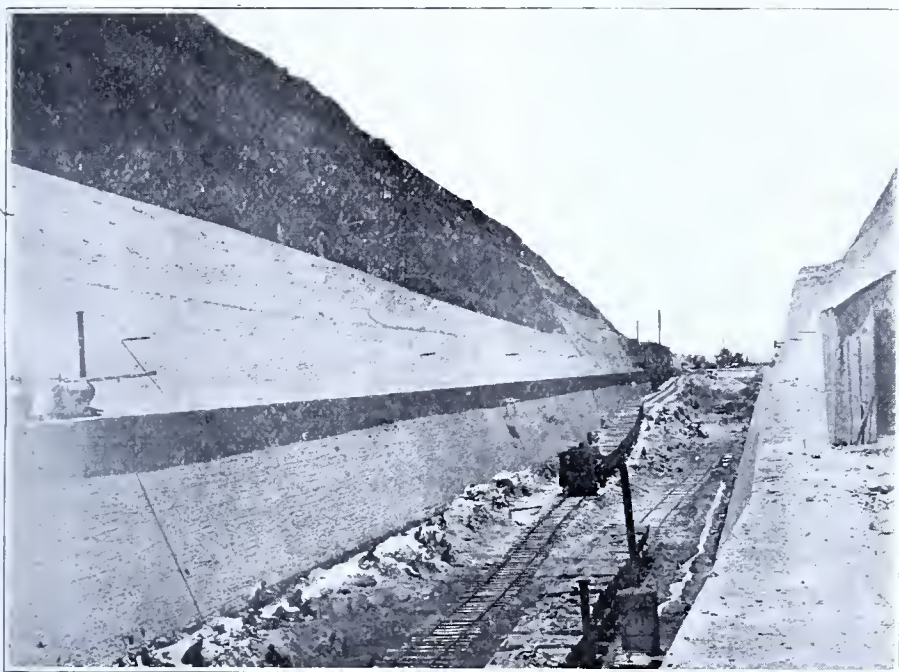
AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 6.

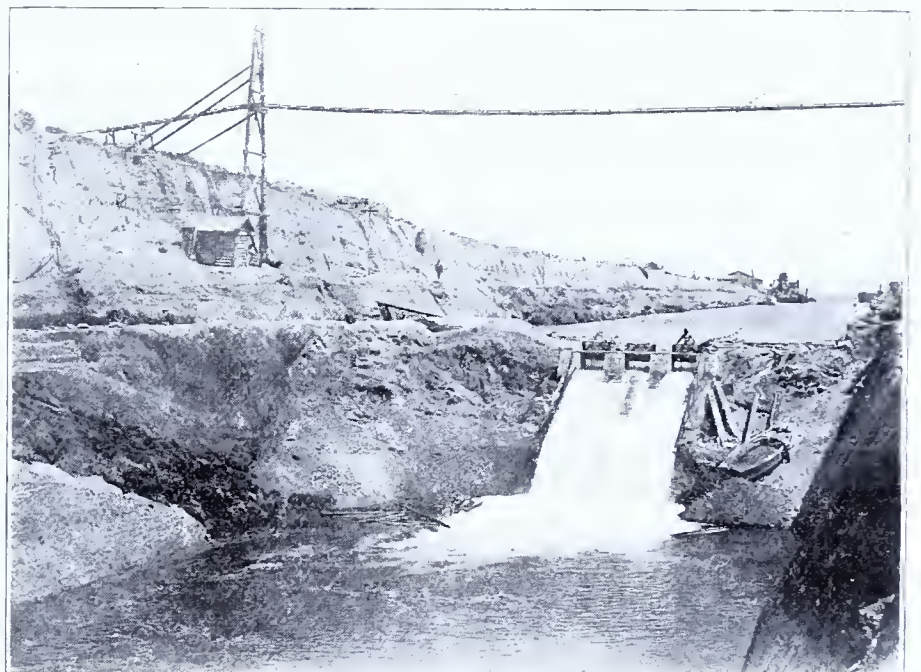
WASHINGTON, D. C.--JUNE, 1903.

SINGLE COPIES 10 CENTS  
ONE DOLLAR A YEAR

--- THE CORINTHIAN CANAL. ---



SHOWING THE CHANNEL MASONRY.



OPENING THE SEA GATES.



COMPLETING THE WORK ON THE ISTHMIAN SIDE.



THE CANAL AS IT IS TO-DAY.

THE HISTORIC CITY OF CORINTH, renowned for the distinctive style of architecture which originated there, and which has won enduring fame from the epistles which the Apostle Paul wrote to its people, has attracted attention two thousand years later because of its connection with the canal that bears its name. The United States is interested in canal construction at present; and the waterway across the Isthmus between the Gulf of Corinth and the Gulf of Aegina presents, in miniature, more than one parallel to our projected

Panama route. Both have to cut through a formidable mountain: both offer a means of avoiding a circuitous journey around a dangerous and windy cape; and both were undertaken and eventually abandoned by companies supported by French capital.

A few details as to the historical side of this undertaking may be of interest. It was as early as 600 B. C., when Corinth was one of the great centers of trade not only of Greece but of the world, that Periander, tyrant of Corinth,



proposed to cut his way through the little neck of land that separated that city from the other marts of Greek commerce. But this progressive tyrant was confronted by too much superstition to make his scheme feasible. It is worthy of note that Periander conceived a remarkable plan, antedating somewhat his canal project, whereby he solved the problem of transportation for a time by constructing a form of channel or chute over the isthmus, through which he was accustomed to drag his ships from sea to sea. The success of this Diolke, as it was called, depended so absolutely upon the uniformity of size of the vessels, that as trade grew and boats expanded in size to meet its needs, the scheme was rendered less and less effective, and was finally abandoned. It was then, we are told, that the tyrant evolved the plan of the canal. The supposed markings of the Diolke are still to be seen on the isthmus.

The canal plan, to the people of that day, meant that the Peloponnesus would be made an island, as its only connection with the mainland would be cut; and the Pythian oracle disposed of it by declaring "Jove himself would have created it an island, if he had so willed." Demetrius Poliorcetes, 300 years later, was confronted by a different, but no less potent form of opposition, for the theory was advanced that to cut a channel through the isthmus would mean the submerging of Aegina and the neighboring islands, since the waters of the Gulf of Corinth were higher than those on the other side; so that the attempt was again frustrated and the isthmus left in peace for another three centuries.

A hundred years after the sacking of Corinth by Mummius, Julius Caesar revived the canal scheme as a means of rehabilitating the once prosperous city: as did also Galgula after him; but neither of the Romans succeeded in effecting anything. To the Emperor Nero belongs the credit of the first decisive attempt to cut through the isthmus. With befitting pomp and ceremony the great undertaking was inaugurated by the Emperor in person, and from evidence still to be seen, the work was prosecuted with vigor; but at the end of sixty days Nero was summoned to Rome and soon afterwards died, and with him perished the first and last ancient attempt to cut the canal.

The resurrection of the scheme may be credited to many in later times—to the Venetians during their occupation of the Peloponnesus; to Governor Capodistria in the early days of Greek independence; to the Cretan engineer Lygouni, and especially to the Greek Government itself, which, in 1869, passed a law authorizing the construction of the canal. But it was not until 1881, that General Turr, aid-de-camp of King Victor Emanuel, obtained the necessary rights for beginning the work and organized a canal company with a capital of \$6,000,000 and with its seat in Paris.

The work began from the Corinthian side and was divided into five sections. Little difficulty was experienced in the first three, or about 5,140

yards of the whole. With the same dispatch, also, the last section jutting upon the isthmian side was made ready. It was in cutting through the 326 yards which stretched between these portions—a section formed of material so hard that the use of dynamite failed to dislodge a single block—that the company met its greatest drawback, and notwithstanding the extension of time accorded for the completion of the contract, the society found itself out of funds and unable to continue the work. A new subscription was made, and the society dispensed with its costly machines—which were useless in cutting through the flintlike strata—and purchased others which in the end proved as unavailable as the former ones. These and other expenses (noted among which must be recorded that of bridging the canal, at a cost of \$80,000) rapidly reduced the newly subscribed capital, and in 1890 the society found itself

the fate of competition, the picturesque water route is almost deserted by foreign craft, and the numerous vessels which come from the north and touch at Patras persist in braving the Greek coast line, the storms off the southern capes, and the twenty-odd hours' extra sailing to a use of the Corinthian Canal.

The reason is that the canal is poorly located. The winds which render the open gulf a raging sea do not subside at the approach to the water way. The canal is like a huge air shaft, and the mighty currents of air which rush from one gulf to the other are not calculated to encourage the mariner to run his ship between precipitous walls 260 feet high and separated by only 80 feet of sea.

A second obstacle takes the form of a reversing current, due to a striking variation in the tides of the two gulfs. The real difficulty, however, is the size of the canal itself: its width at

the difficulties of navigation, and are not sufficient to afford absolute protection to the canal. It is proposed to supersede these barriers by two large harbors that will make the approach less hazardous and will largely regulate the current. No action has been taken, but some such plan is under consideration, although the extraordinary depth of the Corinthian Gulf will render the repairs very costly.

The harbor on the Corinthian side is formed by two arms running from each side of the isthmus and terminating in a line with the two sides of the channel, so that vessels entering are ready to steer ahead. The isthmian harbor is formed of but a single arm, which closes the channel entirely toward the mainland and requires the setting of a new course, both on entering and leaving the canal.

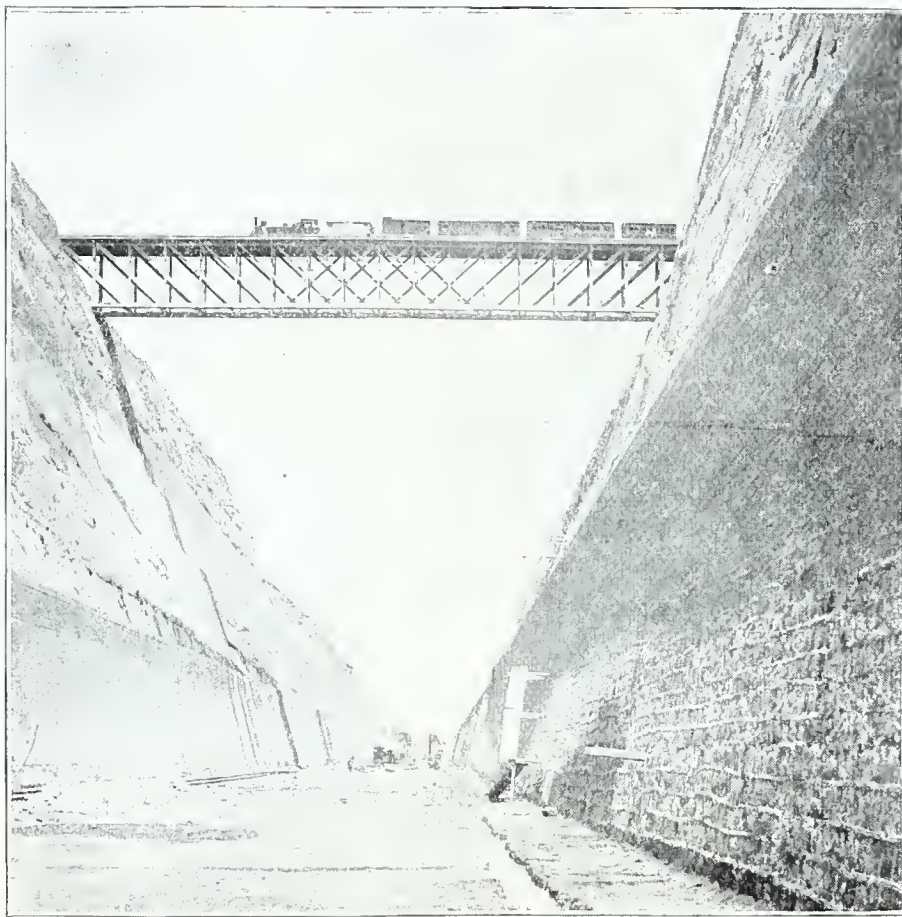
The span of the isthmus, as traced by the canal from gulf to gulf, is 3.94 miles, and its greatest depth 259.7 feet. A solid block of masonry, some 6 feet in thickness, lines the base and sides of the channel to a height of 32.2 feet, or about 7 feet above the sea level, as a protection against the currents, its extremities making a substantial quay on each side from sea to sea. The sides of the channel have required no special protection of masonry, except in a few sections, notwithstanding their precipitous pitch. A passenger on one of the Greek steamers, looking up at the railroad bridge which crosses the canal at a height of 122 feet and is but 262 feet long from end to end, believes himself to be gazing almost straight upward, while the slopes of the deepest part of the channel, by reason of their greater height, rise like two perpendicular cliffs.

The slopes are protected from erosion by conduits which skirt the edge of the summits and carry away all surface water. Sixty electric lamps of 20 candlepower mark the channel at night, and on each side at distances of 600 feet are attached iron stanchions, to which ships may tie in case of accident or as a protection against a driving current.

If one of the present line of foreign steamers should decide that the twenty hours gained by using the canal are worth the saving at any price, or if a Greek line of steamers is fitted out to compete for a share in the far-sea trade, competition will drive the other lines in their wake, and the canal company will come into its share of the receipts which are literally going up in the smoke of every steamship which rounds Cape Matapan.

#### Moss Litter for Horse Bedding.

For several years the so-called "moss litter" taken from the British bog lands has been used as bedding for horses, large companies now rarely employing anything else. It is considered both economical and healthful. Compared with straw, its first cost is one-half or less, one ton of moss litter going twice as far, at least, as one ton of straw. Moss litter is claimed to be a natural disinfectant, deodorizer, etc. The overpowering odor emitted by straw bedding when a barn door is opened in the morning is entirely absent from moss litter. Drains in stables, another source of danger, may be hermetically sealed, it is averred, where moss litter is used. Its absorbent quality is put at ten times its own weight in moisture. Moss litter is coming into use in many continental army stables and is being advocated for the British army.



THE COMPLETED CANAL AND RAILROAD BRIDGE.

again penniless and a receiver was appointed.

The failure of this company represented an outlay of almost \$10,000,000. It was then that Mr. Syngros organized the present enterprise with a capital of \$965,000, which rapidly, but not without hardships, completed the work. Assisted by the National Bank of Greece and the Cretan Industrial Bank, Mr. Syngros at once secured the necessary funds, and, in spite of the solid rock yet to be cut through, the canal was completed three years after the failure of the old company and the formal inauguration celebrated in July, 1893. The canal shortens the distance between all points in the Adriates and the Piræus more than 130 miles. It is not an expensive water route, and it brings Patras and Piræus, the two centers of the export and import trade—at both of which most vessels must touch—within twelve hours of each other. Yet with all these advantages, in an age when a day's time not infrequently decides

the bottom is 68 feet 11 inches, and it has a depth of 26 feet 3 inches. The largest vessel to have used the canal, was the Italian cruiser *Giovanni Bausan*, of the following dimensions: Length, 275 feet; beam, 42.6 feet; draft, 18.4 feet; and tonnage, 3,068. However, vessels of 23.5 feet draft and 68.5 feet beam are permitted by the regulations to pass, which dimensions would include most of the steamers regularly trading in Greek waters. Nevertheless, the exacting pilotage which such dimensions render necessary, emphasized by the reversing current, has so far served to make the canal a much less appreciated water route than it would have been in the days when steamships were more modest in their dimensions.

It is too late to think of changing the size of the route, but the other difficulties can be reduced, and it is probable that some effort will be made to remedy matters. At each approach the small break-waters, while rendering necessary service, contribute to



## AUTOMATIC OUTSIDE BRAKE FOR TRAINS.

THE accompanying illustrations represent a new signalling and brake appliance which has been tested in Switzerland in connection with an engine pulling four passenger cars. The train was running at the rate of 30 miles an hour when it was brought to a stop at a determined point, by means of the invention, with absolutely no assistance or cooperation from the engine driver. The Westinghouse brakes on all the cars were set and released again without any perceptible jar: an automatic whistle gave notice that the apparatus had reset itself: and the stoppage of the train was recorded on a dial.

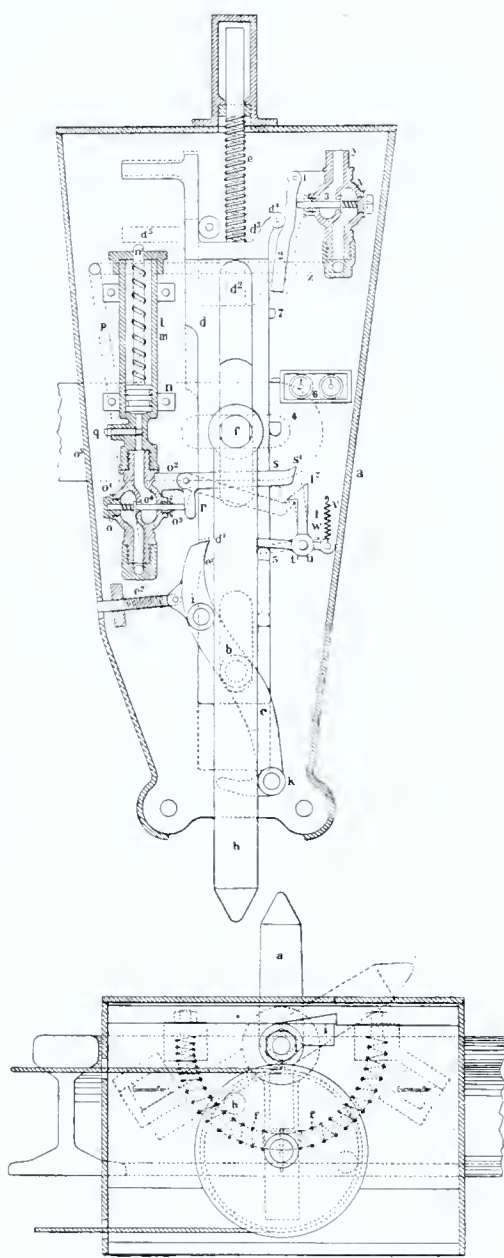
In order to transform the shock, which is heavy at high speed, into a gentle motion, the apparatus is constructed on the principle of two points of contact independent of one another, each of which is provided with a freely oscillating lever. The lower apparatus, serving as the track connection, is connected with all signals, points, curves, gates, etc., so that in the event that it is necessary to stop the approaching train, this lower contact lever is caused to project into the track of the contact lever of the upper apparatus, placed upon the locomotive, and, on touching the same, operates the brake mechanism. The lever, or point of contact on the track may be set by means of a wire operated by hand or by electricity. Emphasis is laid upon the fact that the apparatus does not suffer any injury by the contact. The apparatus may be adjusted either for complete braking throughout or for only partial. By means of a signal whistle at the time of the operation, the engine driver is warned and can himself hasten the braking from the locomotive. The entire arrangement is again brought into operative position by pneumatic power.

Believing that the matter is of great interest to the railroad world, as well as to the public in general, we append a brief technical description:

On the casing *a*, which is preferably fixed on the under frame of a locomotive and the front of which is shown removed, there is pivoted on the pivot *b* a double-armed pawl *c*, the upper arm *e*<sup>1</sup> of which engages in a notch *d*<sup>1</sup> of a plate *d*, which plate is controlled by a spring *e* and moves on a pin *f* by means of the slot *d*<sup>2</sup>. The pin *f* is itself carried on a special arm *g* placed, for instance, on an axle box of the vehicle and touches a contact lever *h*, which is guided below between two rollers *i*, *k* located on the pawl *c*.

There is a cylinder *l* arranged at the plate *d*, in which a piston *n* slides under the control of a spring *m*. At the underpart of the piston is arranged a stop valve *o*, which is in permanent communication by means of the locomotive brake. A screw *q* placed on the foot of the cylinder allows the pressure of the compressed air passing to the piston to be regulated. To the valve body *o*<sup>1</sup> there is linked by means of the lugs *o*<sup>2</sup>, an elbow lever *r*, *s*, one

arm *r* of which rests on the valve spindle *o*<sup>3</sup>, the other arm *s* having an edge *s*<sup>1</sup> which in the depressed position (shown in dotted lines in the drawing) is caught and held in the projection *t*<sup>2</sup> of a pawl *t*. This pawl *t* is pivoted on a pin *u* attached to the casing *a*, and is held in the position shown in full lines by means of a spring *v* and stop *w*. There is another stop valve *x* arranged in the upper part of the casing. This valve is connected on the one hand by means of a tube *y* with a signal apparatus, for instance, a whistle; and on the other hand by means of a tube *z* with the main air reservoir. A lever *2*, against which the valve pin *3* rests, is likewise linked by means of projections *l* to the valve box.



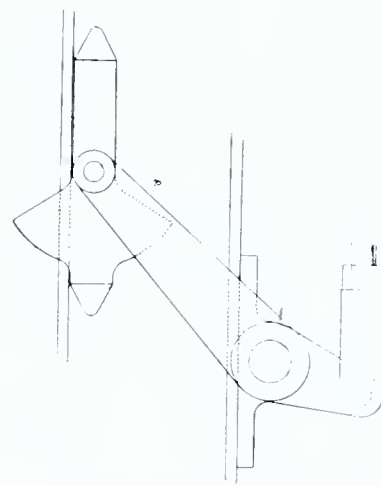
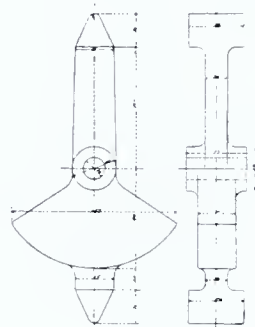
DISTANCE SIGNALING APPARATUS, WITH SELF-ACTING READJUSTING MECHANISM.

The operation of the apparatus is as follows:

Supposing the contact lever *h* be pushed in either direction out of the position of rest by an obstacle on the line, the upper arm *e*<sup>1</sup> of the pawl *c* is thereby turned to the left and the plate *d* released, when the latter falls by its own weight and the action of the spring *e*. Thereby the lever *2*, with the valve pin *3*, is moved to the right by a roller *d*<sup>4</sup> on an arm *d*<sup>3</sup>, so that the compressed air can pass through the tube *z* to the tube *y* and actuate the signal apparatus and warn the train staff.

As soon as the plate *d* has nearly

reached its lowest position, a stop *t* on the plate strikes against the arm *s* of the angle lever *r*, *s*, and brings it into the position shown in dotted lines, when it is caught with the edge *s*<sup>1</sup> by the projection *t*<sup>2</sup> of the pawl *t*, and thereby the valve *o* is opened. In this position of the valve, compressed air passes from the main air chamber through the passage *p* into the cylinder *l*, and raises the piston *n*, whereby the piston rod *n*<sup>1</sup> presses against a lug *d*<sup>5</sup> on the plate *d* and lifts it. As soon as the plate has reached its original position, the upper arm *e*<sup>1</sup>, which is controlled by a spring *e*<sup>2</sup>, of the pawl *c* catches once more into the notch *d*<sup>1</sup> and prevents the plate going back. The upward movement of the piston *n* or plate *d* continues until a lug *5* on the plate strikes against the horizontal arm *t*<sup>1</sup> of the pawl *t*, and brings the vertical arm *t*<sup>2</sup> out of engagement with the piece *s*<sup>1</sup> (dotted lines), whereupon the current of air coming out of the passage *p*, and passing to the cylinder *l* aids the spring *o*<sup>3</sup> to close the valve *o*. At the same time, by the displace-



## Electric Furnaces for Very High Temperatures.

There are few inventions in the electrical field which have benefited the chemist and metallurgist more than that comprised under the general title of "electric furnaces." Up to, comparatively speaking, a few years ago, the highest attainable temperature by any known artificial means was 1800 degrees Centigrade, or, possibly, with exceptional facilities and the exercise of great care, as high a temperature as 2000 degrees Centigrade may, in some cases, have been attained, though the exact limit is questionable. Certainly it does not rise much above the latter figure. Thanks, however, to the indefatigable researches of Moissan, Siemens, Borchers, Cowles, and some other investigators, we now possess a means for the artificial production of temperature far above this limit, which enable us to fuse and otherwise treat commercially such hitherto refractory substances as chromium, platinum, carbon, and even the once indestructible crystalline form of that element, the diamond.

Generally speaking, electric furnaces may be divided under two main headings, namely, those in which the heating effect is produced by the electric arc established between two carbon or other electrodes connected with the source of current, commonly known as arc furnaces; and those in which the heating effect is produced by the passage of the current through a resistance, which either forms part and parcel of the furnace proper, or is constituted, by a suitable conducting train, of the material to be treated in the furnace. The principle of this latter type is analogous to that involved in the heating to incandescence of the ordinary electric lamp filament. Such furnaces are, as a class, known as resistance furnaces.

The experience of late years in the construction and use of electric furnaces trends towards the establishment of the resistance furnace as a type more readily capable of efficient regulation.—*Cassiers Magazine*.

## Makes Train Operation Safer.

Extensive experiments made by the St. Paul, the Omaha, the Buffalo, Rochester and Pittsburg and other railroads have gone far toward convincing the officials of these companies that a valuable aid in the safe operation of trains has been found in a new device known as the telegraphone. The device has been put in use on a portion of the New York Central's lines and is proving eminently satisfactory. The telegraphone is an apparatus which provides immediate and perfect telephonic communication between trains, cars or engines and any telegraph office along the line of railroad. The mechanism is simple. Connection is made from the train or car to the telegraph line by means of a metallic rod, which looks like a jointed fish pole; and also by means of a ground connection. The end of the rod is hooped over the wire, and the telephone in the car has positive and negative connections which make communication in either direction possible.

By means of a magneto machine in the car a current is sent which produces a buzzing sound in the telegraph relay at the offices on the line. The operator receiving the call answers through the telephone in his office. During the experiments on the Omaha road the messages received were so strong as to be audible in any portion of the car. Conversation was carried on without the slightest interruption to the telegraph business done over the same wire.

ment of the valve pin *o*<sup>3</sup>, the lever *s* moves back into the original position. As the lever *s* is now free and the supplying of air to the cylinder *l* has ceased, the air compressed therein, driven out by the weight of the piston *n* and the pressure of the spring *m*, and blowing slightly against the arm *r* of the angle lever *r*, *s*, is enabled to escape through a passage *o*<sup>4</sup> arranged in the valve pin *o*<sup>3</sup>, so that the piston can return automatically to its original, lowest position, while the plate is held up after a short downward movement of the pawl arm *e*<sup>1</sup>.

The moving upward of the plate *d*, however, also admits of a lateral displacement of the valve pin *3*, which is controlled by a spring, so that the supply of air to the signal apparatus (whistle) is also interrupted.

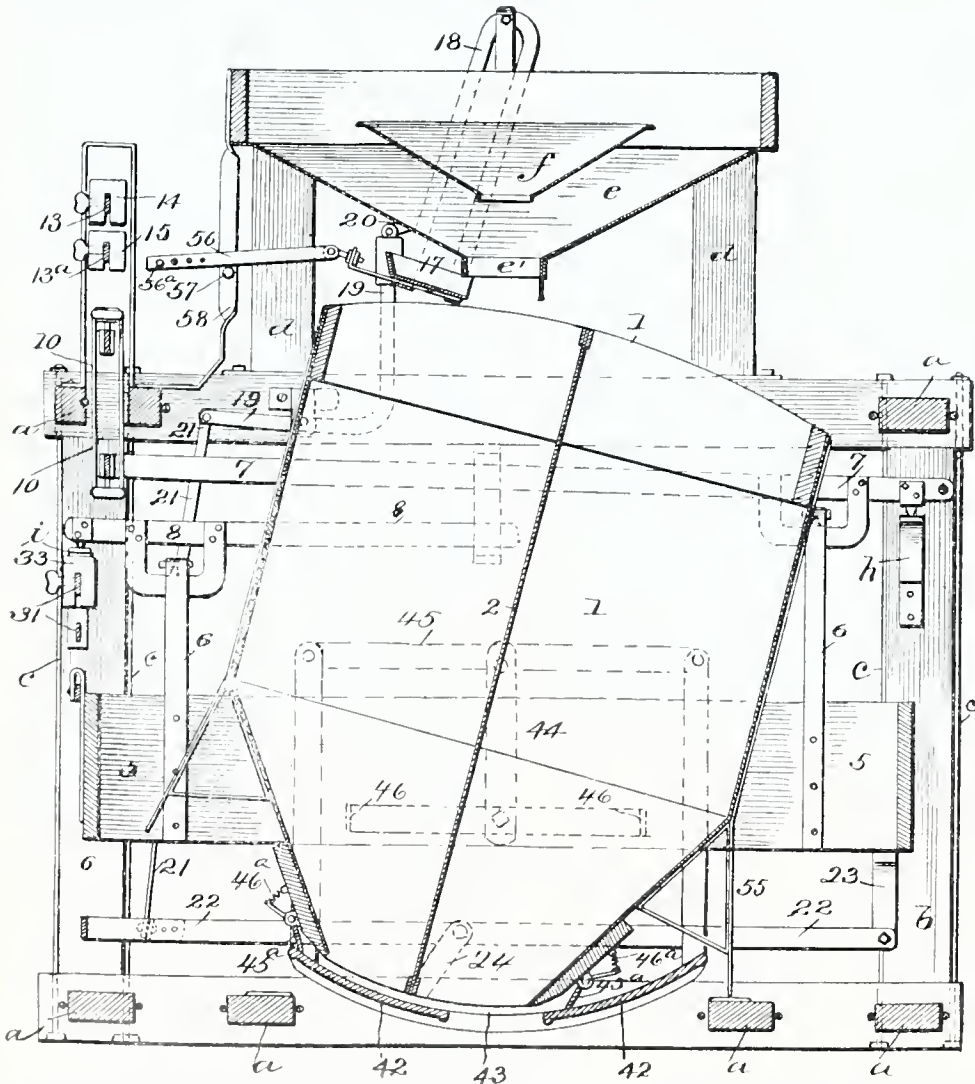


# CLEVER NEW PATENTS.

Automatic Grain Weighing Machine.—Vehicle Running Gear.—  
Manufacture of Buttons.

## Automatic Grain Weighing Machine.

Messrs. Angus and John-H. McLeod, of Marietta, Kansas, have obtained a patent on an extremely important invention in the line of automatic grain weighing machines. In the present apparatus the grain is received into a stationary hopper and discharged therefrom into a movable weighing hopper or bucket, which is so connected with the graduated weighing beam as to tilt the latter when duly filled, whereupon the valve or gate of the weighing hopper is opened to allow discharge of the contents. The accompanying illustration is a sectional view through the apparatus. A stationary frame is employed comprising upright and horizontal beams, and upon the top thereof there is supported a grain receiving hopper *e*. Within the same is located a second hopper *f*, which has a similar form and is made of about one-third its size. The smaller hopper is spaced from the larger one to allow the overflow of the grain in case the discharge capacity of the small hopper is exceeded. Its function is to prevent the too rapid descent of the grain into the receiving hopper and therefrom into the weighing hopper arranged below the same. In other words, the smaller hopper is to break the force of gravity to a certain degree by limiting or partly arresting the flow of grain. The weighing hopper *1*, is divided centrally and vertically by a partition *2*, whereby two compartments of equal size are formed. This hopper is pivoted to opposite sides of a wooden frame *5* arranged within the supporting frame and suspended by means of links and bars from the weighing scale mechanism, shown at 10, 13 and 13a. The lower end of the weighing hopper is open, and arranged directly beneath it are gates or valves *42*, separated by a slot *43*, through which the grain discharges. The valves are fixed in place, and the hopper being free to oscillate will slide over them, so that the lower open ends of the compartments will alternately register with the slot. The grain is cut off at the receiving hopper by means of a suitable pan *17*, which can be adjusted as desired.

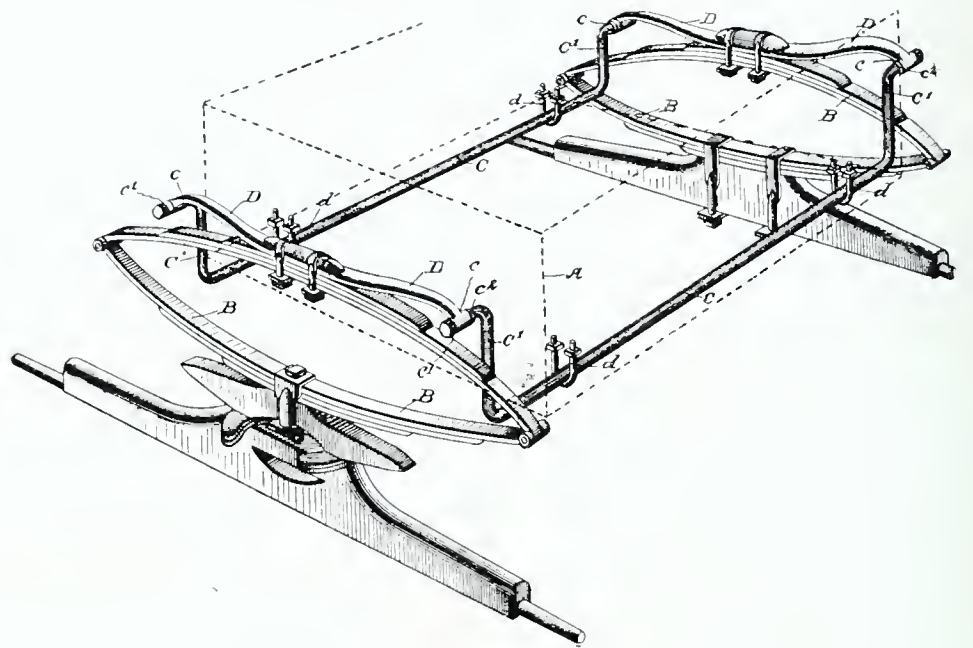


As shown in the illustration, when the upper end of one of the compartments is beneath the hopper, the lower end of the compartment is closed by the valve, and grain passing through the hopper will flow into the compartment in a steady stream. When nearly the desired amount of grain has passed into the compartment, the pan or tray *17* will pass beneath the discharge of the grain-receiving hopper, thus gradually cutting down the flow to a dribble stream, and as soon as the required weight is reached, the weighing hopper descends and at the same time turns so as to discharge its contents, simultaneously moving the other end of the upper compartment into alignment with the discharge end of the grain-receiving hopper.

## Vehicle Running Gear.

Mr. John G. Hess, of Hagerstown, Maryland, has devised an improved vehicle running gear, the object being the provision of new connections between the body and springs, wherein the jar of travel is lessened, so that a vehicle provided with the improved gear is very much more comfortable and has better wearing qualities. Referring to the accompanying illustration, the letter *A* designates the body of the vehicle, and *B* the springs thereof at front and rear. *C* designates lateral bars or rods of strong metal and having upwardly extending crank-arms *C* at front and rear, and provided at their free ends with

pivotal connections as *c*, with the ends of traverse bars *D* clipped to the vehicle-springs. In the depending seats formed by these cranked side bars is hung the vehicle body, which has a pivotal connection with such bars by means of clips *d*. The lateral bars or rods *C* may extend continuously between their cranks, as shown, or may be separate between the cranks of each bar in case the wheel-box or other obstruction intervenes.

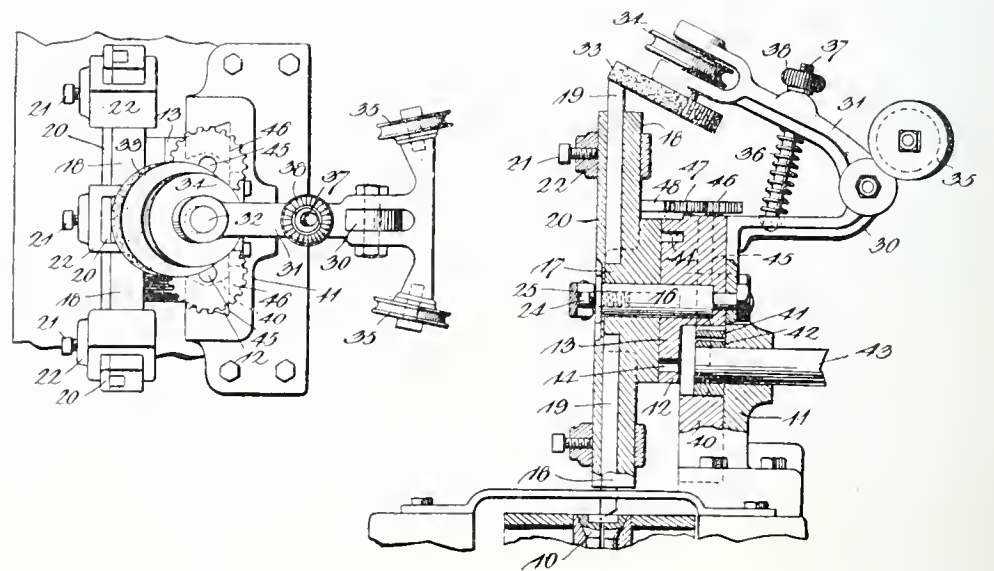


It will thus be seen that under shock or jar upon the wheels in travel, the vehicle body and its occupants or load, being free to swing to one side or the other and being free to move up and down, owing to the vehicle springs, will be materially relieved of abrupt jars or shocks, with much greater comfort to the occupants and lessened strain upon the vehicle as a whole.

## Manufacture of Buttons.

In the manufacture of buttons from mother-of-pearl and material of like nature, much difficulty is experienced in keeping the tools in proper condition, the material being extremely hard and the machines being operated at a comparatively high speed. The cutting, turning, shaping, and drilling tools require frequent sharpening, and in machines ordinarily constructed it is necessary to remove the tools from the machine for sharpening purposes, and when a fresh tool is placed in position, considerable time is lost in properly adjusting the same. To overcome this objection, and to provide a supply of sharpened tools which may be instantly moved to operative position, is the principal object of an invention patented by Mr. George W. Pelton, of Muscatine, Iowa, and assigned to Boepple Button Company, also of Muscatine.

The machine is an ingenious one. Directly over the button holding chucks is arranged a frame in which is journaled a revoluble tool holder having a plurality of radial tool supporting arms. This holder is movable toward and from the chuck, so that the tool located over said chuck may be brought into or moved out of engagement with the button. Located over the top of the tool-holding mechanism is an ordinary swinging arm carrying a sharpening disk which is revolved through the medium of a suitable driving belt or cord



passing over the tools mounted on the frame. The operation of the machine is very simple. The tools are first adjusted in the arms of the carrier, and the latter is then rotated once in order to bring the operative end of each tool into contact with the grinding disk in order that the distance between the cutting edges of the tools and the center of rotation of the tool carrier may be uniform. The button blank chucks which may be of any desired construction and operated in any suitable manner, are then presented beneath the tool carrier and are revolved, while the tool carrier is forced down by a suitable cam in order to bring the tool into contact with the central portion of the blank. When the tool becomes dull, the tool carrier is revolved to bring the successive one into operation, while the worn tools are gradually and successively turned until they are brought into contact with the grinder, and thus automatically resharpened, the entire operation being obtained in a cycle of movements.



## THE UTILIZATION OF WASTES AND BY-PRODUCTS IN MANUFACTURES.

WITH SPECIAL REFERENCE TO THE DECADE OF 1890-1900.

By HENRY G. KITTREDGE, of the Census Bureau.

### PART X.

#### STARCH INDUSTRY.

There are a number of by-products produced in the manufacture of starches from cassava, potato, corn, wheat, and rice. By-products in the manufacture of rice starch are the rice hulls, which are used mainly as fuel and packing material, but are also ground up and used for the adulteration of spices and the higher grade feed stuffs. As a food product they are of little value, on account of their indigestibility and excessive amount of fiber. Pure rice starch is not made to any great extent, the rice flour being generally sold as rice starch.

Wheat starch is generally made by one of two processes: (A) Wheat flour is made into a dough and the starch washed out in suitable machines, the gluten conglomerating and separating as a tenacious, sticky mass. This is dried and forms the wheat gluten of commerce. It is used as a food article or as a mixing product to raise the percentage of proteids in low-grade feeds. Its utilization is still in its infancy, and its application to the arts is in the experimental stage. (B) Wheat flour is allowed to sour or ferment, and then the starch is separated mechanically on starchruns, the gluten being taken off as a thin fluid, which is generally not recovered. If recovered, it is dried and gives a product similar to that made in process A.

The cassava-starch industry is confined to Florida. The manufacture is still in the experimental stage, and no reliable data are at hand.

For potato starch the potatoes are peeled and ground and the starch washed out and separated by mechanical processes. The by-product is potato slop, which is used as a cattle food in the immediate vicinity, in a wet condition. The potato and cassava industries are of small importance.

**Corn starch.**—About 99 per cent of the starch manufactured in the United States is made from corn, the daily maximum consumption being about 180,000 bushels, yielding 2,500,000 pounds of starch and 4,000,000 pounds of glucose or sugar. From a manufacturing standpoint the kernel consists of four parts: Starch, gluten, germ and bran, of which the gluten, bran, and germ are by-products. These by-products are separated by mechanical means, the process being somewhat as follows: Corn is soaked in moderately warm water for from twenty-four to sixty hours, to which a very small amount of sulphurous acid has been added to prevent fermentation and to loosen the intercellular tissue between the starch and gluten cells. The excess of soak water is then run off and the wet corn ground in such a way that the germs are loosened without being cut up or broken. The whole mass is then run

into separators, where the free germs are floated off as wet germs. These are dried in suitable driers, then ground to a flour and the oil extracted by hydraulic pressure, leaving the corn oil cake as a by-product. This product forms one of the staple cattle foods, and contains about 24 per cent protein and 10 per cent fat. The nutritive and digestible properties are very high. Ground oil cake is known as germ oil meal. The average production is about 2 to 2½ pounds per bushel. Over 50 per cent of it is exported.

The corn mass, free from the germs, is then ground very fine and run over bolting cloth sieves. Here the bran of the corn is separated and remains on the sieves. The product that remains in the bolting-cloth sieves is pressed, and, combined with about 50 per cent of water, is sold for immediate consumption. It is known by various names, as "glucose food," "slop," "corn food," "sugar food," etc. It heats and quickly deteriorates in the wet condition, but can be preserved for a time during hot weather by salting. The same product dried is known as "corn bran," "dried glucose," or "sugar food," or some fancy name. The food is easily digested and competes directly with wheat bran. Its composition is about 11 per cent protein and 3 per cent fat. Mixed with the gluten meal described below, it forms gluten food. The yield per bushel is about 4½ pounds.

The substance passing through these sieves, mentioned above, is a mixture of starch and gluten. The starch is separated by gravity from the gluten, the mixture being run over long level planes, as starch tables, runs, or gutters, where the starch settles out as a first mass and the gluten passes away at the ends. This gluten is settled and gives what is termed wet gluten. The starch taken from the tables is used as the raw material for the manufacture of the various grades of commercial starches, or it is treated with acid and converted into the various grades of glucose or grape sugars. The wet gluten pressed and dried forms gluten meal, the composition of which is, protein 38 per cent, fat 3 per cent, and starch 40 per cent. This is one of the richest and best food products on the market. The nutritive value is very high, and the factor of digestibility ranges from 92 to 96 per cent. The yield per bushel of corn is about 5½ pounds. The gluten meal is treated for the recovery of its starch, and gives two new products, a concentrated food stuff, characterized by the large amount of proteids (60-70 per cent) it contains, and a maltose sirup. This food stuff is suitable for human consumption, and also for raising the percentage of proteids in foods that have a small amount of these substances. When the wet bran and the

wet gluten are mixed in the proportions as obtained from the original corn, and the mixture dried, the resulting food is known as gluten. This is the most common food product in the starch and glucose industry, and represents about 80 per cent of the food output. Its feeding value is very high and its digestibility above 90 per cent. Its composition is about 28 per cent protein and 3 per cent fat.

Corn oil cake and gluten meal are exported extensively. The bran and gluten food is used almost exclusively in the United States. The production per bushel of corn is about 12½ pounds of food, giving a maximum daily production of from 1,200 to 1,300 tons, valued at \$25,000.

#### CORN PITH.

Among the uses of waste products may be mentioned the application of the pith of the cornstalk to naval and military uses for the protection of vessels, forts, or other structures from the injurious effects of collision, projectiles, or otherwise. Efforts have been made from time to time, for many years, for some means of readily and effectually closing openings made in the hulls of vessels by collisions or projectiles. Different substances have been proposed, and some have been adopted, that have proved more or less serviceable.

Masses of cork or other light material have been used, extending to the water line of the vessel, so that in the event of the place being pierced by shot, no more water could enter than would fill the place traversed by the shot, and thus the buoyancy of the vessel would be but slightly interfered with. The amorphous cellulose of the cocoanut has been used with advantage as a barrier or cushion to protect vessels, forts, and other structures. The discovery that a material can be prepared from the pith of cornstalks, which possesses in a high degree all the qualities desired, was made by Mark W. Marston, of Philadelphia. He found that this substance had a capacity to absorb water or moisture of over twenty times its own weight, which exceeds the absorptive capacity of any known substance capable of

like uses. Further, the rapidity with which the water is absorbed by this substance is said to be greater than that shown by any other: thus a compressed body of this material will absorb water to fully one-half its capacity, or ten times its weight, almost as soon as water is brought into contact with it. The inventor found that if the substance were dried after being saturated, it substantially returned to its former condition and acted as before on again being wet.

#### CORN OIL.

Corn oil is a valuable by-product of breweries, distilleries, and starch works. It is adapted for illuminating purposes, and the claim is made that it may be advantageously used for dressing wool, and also as a machine oil, and in the manufacture of soap. It might, in certain cases, be applicable as a lubricant, its low acidity and little tendency to deposit solid matter or to "gum" being properties that recommend it for this purpose. Donard and Boulet, at their works at Bapaume-Les Rouen, France, have treated during the last seven years about 28,000,000 pounds of corn cake, from which 7,700,000 pounds of oil were extracted. Corn oil is the most valuable product obtained from the corn kernel in the manufacture of starch, being worth more than the main products—starch, glucose, or grape sugar. Corn oil can be treated with sulphur (vulcanized), giving a product similar to rubber, which is used to mix with rubber for the manufacture of all kinds of rubber goods. The oil itself is used in paints. It is a nondrying oil, very stable, and does not become rancid. The characteristic taste and smell are eliminated through refining. Seventy-five to eighty per cent of this oil made in the United States is exported.

The maximum daily production of corn oil in the United States is about 275,000 pounds worth \$16,000. The value of the by-products, feed and oil, are about 20 cents per bushel of corn.

THE INVENTIVE AGE contains sound advice to Inventors and Patentees. For lack of such advice many have lost money. Subscription, One Dollar a Year.

## P A T E N T S

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-THREE YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

### INVENTIVE AGE

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

E. G. SIGGERS, 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Jean Orteig, Tempe, Arizona. Vehicle Brake.—The object of the invention is to provide an improved brake mechanism to be applied to the running gear of any ordinary vehicle, and adapted to engage the ground and raise the wheels of the vehicle off the ground so as to check the movement of the vehicle. A further object is to lock the brake in both its applied and inoperative positions. It consists essentially of a vertically swinging brake standard carried by the running gear and having a foot for engagement with the ground, independent controlling levers having connections, respectively, with the outer free end of the standard and an intermediate point thereof, means for locking the standard in both its operative and inoperative positions, and a controlling lever for the locking means.

Jesse W. Pierce, Belton, Texas. Can Opener.—The invention relates to devices of this class embodying a fulcrum point to be inserted into the center of the head of a can, about which point the device is adapted to be swung so as to cut the head of a can in the path of a circle. It is the object of the present invention to arrange the stem and handle of the device so that the latter may be employed as a driver, to force the pointed end of the stem into the head of the can. To this end the handle is weighted and slidably mounted upon the stem, a stop engagement being provided between the stem and the handle to limit the inward movement of the latter. The cutter is carried by the handle, and is operated in the usual way.

Ernest F. Ogborn, Converse, Ind. Razor Cleaner.—The object of this invention is to dispense with the employment of paper in holding the razor removed from a razor while shaving. It consists of a cup-shaped receiver which is adapted to be attached to the hand of the user, whereby it will always be in convenient position for use. The receiver is intended to be constructed of leather or soft rubber, so that it will not injure the edge of the razor. The provision of such a device would add much to the cleanliness of barber shops.

Andrew J. Comstock, Tyler, Texas. Cotton Cultivator. E. L. Booth, Assignee, same place. The object of the invention is to provide a durable frame structure arranged to be conveniently manipulated, especially in reversing the device at the end of a row. A further object is to construct the frame portion so as to automatically accommodate the shovels to the uneven character of the ground. A still further object resides in providing means for supporting the shovel beams in an elevated position, so as to hold the shovels out of contact with the ground. To accomplish the ends sought, the shovel beams are loosely connected to a wheeled frame, and the supporting means consist of a bar having a hinged connection, which moves upwardly on raising the beams and drops down in position to support the beams above the ground.

William W. Ketler and Edward Britton, North Lawrence, Ohio. Claw Bar.—The invention consists of a fulcrum block, a claw having an endwise slidable and pivotal connection with the block, and an operating lever pivotally connected to the forward portion of the claw and having its intermediate portion constructed to bear against the block as a fulcrum support. By this arrangement, the

base or fulcrum block, the claw and the operating lever, are formed in separate members, so as to be readily replaced in the event of breakage. The invention also provides for seating the claw into snug engagement with the spike to be withdrawn by the initial movement of the lever, and also to secure a powerful operation of the lever, and a comparatively long range of action for the claw.

William H. Null, Philoah, W. Va. Cooking Stove.—In this invention the fire box is located so as to effectually heat both the cooking oven and the warming oven, and it is also disposed in such a position as to form a convenient support for a water tank, and thereby leave the top of the stove unobstructed. A single damper is employed for controlling the supply of heat for the two ovens, and said damper is located in position for convenient adjustment. Means are provided for conveniently supplying fuel to the firebox without removing the water tank therefrom. An improved grate and ashpan is arranged, whereby the grate may be conveniently removed whenever desired, and is normally held against displacement by the ash pan. The invention has many advantages over the usual cooking stove, and should meet with much favor when introduced.

Mrs. Sallie C. Pearson, Montgomery, Ala. Skirt and Hose Supporter.—The aim of the present invention is to provide a device, which may be suspended from the shoulders of the wearer, and is adapted for supporting the skirt, hose, bustle, and hip pads, and thereby remove the strain of such articles from the hips of the wearer to the shoulders thereof. The invention is furthermore designed to dispose the skirt supporting means so that the weight will be substantially balanced by the strain upon the hose supporting means, thereby to equally distribute the strain upon the shoulders of the wearer and prevent displacement of the device by the movements of the wearer. In carrying the invention into effect a belt or waist band is provided, suspender straps are connected thereto, skirt-supporting projections are carried by the back of the belt to form a ledge over which a skirt is adapted to be snugly drawn, and hose supporters are connected to the front of the belt.

James R. Mead, Inventor, Georgetown, Delaware. Signalling Apparatus. Assignees, William E. Veasey, Lewes, Del., and Alfred B. Robinson, Georgetown, Del. Heretofore, marine and other signalling has been carried on through the medium of flags hoisted to an elevation by suitable flag halyards. As is well known, the flag system of signalling is unreliable, and it is the object of the present invention, to provide for displaying signals in such a position as to be exposed to the party for whom the message is intended, independent of the direction of the wind prevailing at the time the signal is made.

The invention consists of a mast or tower which is rotatably adjustable upon a vertical axis, guide rods carried thereby, a signal holder slidably mounted upon the guide rods, a signal slide removably carried by the holder, and means for raising and lowering the signal, the arrangement being duplicated at opposite sides of the mast, whereby the signal at one side of the mast may be elevated and maintained in a displayed position, while the signal holder at the opposite side of the mast is held in a depressed position for receiving a signal.

The invention contains a number of broad claims, and has been tested at Lewes, Delaware, and found to meet every want of marine signalling.

William B. Thomas, Towns, Ga. Burglar Alarm.—This invention combines the functions of a window lock, burglar alarm, and fire alarm. Means

are provided to render the device safe from accidental discharge, and yet adapted to do effective work when used as a fire alarm. The device is arranged in such relation with regard to a window, as to be out of sight and reach from the outside, and shielding it from being tampered with from the inside, which might result in accidental discharge.

To carry out the purpose as stated, an endwise movable fire arm is employed, which is normally inclined towards the closure to be protected, but out of the range thereof so as to obviate obstructing the same. Means are provided for imparting endwise movement to the fire arm to project the same with respect to the closure when an opening movement of the latter is made, and relatively fixed means located in the path of the endwise movement of the fire arm, effects explosion of the contained charge. There are other features of the invention, which peculiarly adapt it for the purposes stated.

William B. McCrosky, Eureka Springs, Ark. Jar Closure.—This invention is designed as an improvement upon a closure for jars covered by patent No. 598,667, and the invention consists of a jar having an external annular flange upon the neck thereof, said flange having its under edge inclined upwardly and outwardly, and the outer edge of the flange inclined upwardly and inwardly. The cover has a marginal edge inclined upwardly to correspond with the outer edge of the neck flange. Oppositely inclined cam surfaces are provided upon the top of the cover, and separate clamps connect the cover to the jar, each clamp being provided at opposite ends with rigid laterally projecting shoulders, which engage respectively under the inclined edge of the neck flange and over one of the cam surfaces of the cover.

John H. and John L. Mann, Smithton, W. Va. Castle Brook Carbon Black Company, Williamsport, Pa., assignee of entire right. Three patents.—The manufacture of lamp black is an important industry in this country, furnishing as it does, the base for the high-grade inks used in printing the monthly magazines, and also as an ingredient of black dyes. There is a constant demand for the material which is scarcely met by the domestic production. The aim of the three patents obtained by the Castle Brook Carbon Black Company is to produce in a ready and thoroughly practical manner with a given volume of natural gas or other carbon-producing agent, the maximum amount of high-grade carbon black.

In the first patent, the carbon collectors consist of wheels spaced apart on a horizontally disposed shaft and having wedge-shaped peripheries. Perforated deflector plates are arranged in the spaces between the wheels, and weighted scrapers coact with the wheels to scrape off the carbon deposited thereon. In the space within the casing above the carbon collecting wheels, open-ended cylinders are arranged forming additional collecting means for the carbon.

In the second patent, instead of making the wheels wedge-shaped, they have a T-shaped collecting face, and the carbon-producing means, which is arranged below the carbon collectors, consist of a plurality of burners, each burner having a plurality of tips which are individually adjustable in a vertical direction, and disposed in the arc of a circle. In the space above the carbon collecting wheels is arranged an open-work cylinder on which the carbon is deposited, having a brush working against the outer surface of the cylinder to remove the lamp black therefrom. In this patent is shown a further improvement in the weighted scrapers.

The third patent, which was issued to John L. Mann, has the carbon collecting wheels mounted on a horizontal

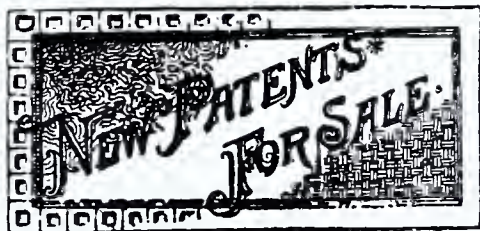
shaft, separated by spaces, and provided with flat carbon collecting heads. Double scrapers are provided. One set of scrapers engage the peripheries of the wheels, and the other scrapers the sides of the wheels. The carbon-producing means are provided with open-ended perforated, flame-confining devices, which embrace the burners and are adjustable towards and away from the carbon collecting wheels. The burners are likewise vertically adjustable, and are arranged in an arc eccentric to that of the collecting wheels.

John Lorch, Jr., Williamsville, New York. Sign.—The invention is particularly intended as a route sign to be used upon cars for indicating their direction or route, though it may be employed for many other purposes. It is so arranged that it can be illuminated at night or employed in the daytime, a lamp being located within the same and disposed so that no direct rays of light therefrom will pass through the sign, the rays being deflected or diffused. A suitable casing is employed within which is mounted a semicylindrical reflector. A lamp is located within the lower portion of the casing and in front of the reflector. The open front of the casing is covered by a slidable closure made up of separate sections, one of which is imperforate and covers the lamp, this section being provided in its upper edge with a groove or seat. Slidably mounted upon the lower imperforate section is the sign section having suitable words of direction cut therethrough. This sign section is located out of alinement with the lamp, and thus the rays of light must be diffused through the entire casing before finding escape through the cut-out lettering. The sign is thus uniformly and brilliantly illuminated. In the daytime a blank sheet is slipped behind the sign section so as to clearly display the words thereon.

Martin L. Miller, inventor, W. I. Hill, assignee, Sealy, Texas.—Cattle Guard.—The object in the present instance is to provide a guard which will constitute an impassable obstruction to cattle attempting to move along a railroad track, said guard being entirely out of the way of passing trains. A pit or cavity is formed in the railroad track at the point of location of the guard, and over this pit are pivoted two vertically swinging members having depending arms with links connecting the arms. With this construction, should an animal attempt to stray along a track, it will step upon one of the sections, consequently, depressing it and immediately throwing the other section to an upright position, forming a fence across the track. Exactly the same operation will take place should the animal attempt to pass in an opposite direction. On the other side of the rail are arranged two sections having spaced pivots. Either of these sections when stepped upon at one end will have its opposite end elevated, and this upward movement is limited by suitable stops engaging the pivots.

Andrew J. Goldsby, Pronax, Mo. Wire Stretcher.—The invention is adapted to stretch wire in various positions. For instance, it is arranged to draw together opposite portions of wire which are to be spliced or connected, and in doing this there are connections made with the post and the operation is effected without applying strain to the latter. It consists of a pair of lever members terminating at corresponding ends in handles, and having a mutual fulcrum connection at their corresponding opposite terminals. The lever members are made in two parts, and are shaped in such a way as to provide wire clamps at intermediate points, the clamp of each lever member being active when inward strain is placed upon said lever.





Advertisements inserted in this column for 25 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 723,173. Will no doubt be adopted by all railroads when fully known. Invented and patented by a railroad conductor. Patent for sale, or royalty will be considered. Address, J. W. Marthis, Columbus, Nebr. (aug)

**FOR SALE**—Patent No. 722,840. Machine for picking prunes or like fruits. Should be in the hands of every fruit grower. Address, John H. Hammer, Medford, Oregon. (aug)

**FOR SALE**—Patent No. 723,064. Cement Fence Post. Most practicable and valuable invention of the age. Stands up to every test. State, county, and township rights for sale. Address, Louis H. Stoner, Albany, Indiana. (aug)

**FOR SALE**—Patent No. 723,705. Grate. Easy to put in stove or range, and can be sold cheaply. Will save coal. Will sell United States Patent or sell state rights. Address, Mrs. Clara Nunan, Box 67 Cape Porpoise, Maine. (aug)

**FOR SALE**—Patent No. 723,248. Farm Gate. Testimonials furnished as to practical value of gate. Write for particulars to F. M. Dann, Footville, Wis. (aug)

**FOR SALE**—Patent No. 723,695. Metallic joint for cross bar, thill coupling, and poles. Malleable iron. Quickly put on. Simple and strong. For repairing broken tenons and irons cannot be beat. Address, John G. Lovejoy, Greig, N. Y. (aug)

**FOR SALE**—Patent No. 721,948, March 3, 1903. Wire stretcher for woven or barbed wire. Simple, rapid, durable, powerful. Proven the best. Ask for model. J. A. Foster, Salem, Wis. (aug)

**FOR SALE**—Patent No. 718,107, dated January 13, 1903. A dishwashing machine. Does good service, and is easily propelled. Address, Anna M. Dunder, Crete, Nebraska. (aug)

**FOR SALE**—Patent No. 723,364. Rail-joint Nut Lock. The best yet for safety, simplicity, durability and economy. For particulars address, Frank Chambordon, Braeburn, Pa. (aug)

**FOR SALE**—Patent No. 33,474. Railroad Rail. Price \$100. Address, Charles Kofske, Applington, Iowa. (aug)

**FOR SALE**—Patent No. 724,276. Corn Harvester and Husker. Very simple and practical. Address, Arthur Forgy, Middletown, Missouri. (aug)

**FOR SALE**—"Loop-the-Loop Basket Ball" is the new game. Device sold by—The National Psychological Institute, P. O. Box 52, Washington, D. C. (jly)

**FOR SALE**—Patent No. 652,655. Improved Trace Fastener. A splendid invention. Address, W. G. Lee Woods, San Antonio, Tex. (sep)

**FOR SALE**—Patent No. 721,606. Air Pressure Oilier. Works perfect in cold weather and in dust; simple construction. Will sell outright or on commission basis. The most meritorious article of its kind for the market. Address, W. A. Reinecke, Heizer, Kans. (jly)

Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING CO., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

**"THE INVENTIVE AGE."**

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O.....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

**FOR SALE**—Car Seat patented Oct. 15, 1901, No. 684,747. It is a good and practical invention and a rare chance for a live man. Good reason for selling the same. Address, C. E. Cole, Box 131, Lindale, Ga. (jly)

**FOR SALE**—Patent No. 719,012. Automatic Rain Water Cutoff. Runs only clear water into cistern. Works without attention. Will sell outright or county rights. Also Saw Handle patent No. 562,787, and School Desk patent No. 520,026. Address, George J. Krieger, Jr., Wooster, Ohio. (jly)

**FOR SALE**—United States Patent No. 724,819, dated April 7, 1903. Also Canadian patent. Rotary Engine. Practically combines great power in a cheap and durable engine. Without a dead center. Address, J. M. Crowley, Carl Junction, Mo. (jly)

**FOR SALE**—Patent No. 724,587. Car-Truck Jack. Can be used on derailed railroad engines as well as cars. Price \$10,000. Address, Charles Kofske, Applington, Iowa. (jly)

**FOR SALE**—Patent No. 31,718. Washing Machine. It cannot be surpassed for washing heavy garments. Any child ten years old can operate it. Can be manufactured cheap. For further information address, J. R. Wilson, P. O. Box 63, McDowell, W. Va. (jly)

**FOR SALE**—Hoisting Mechanism for Tractor and Portable engines. Will trade it for property or real estate. For particulars write to Fritz Bender, Little Rock, Mo. (jly)

**FOR SALE**—Patent for sale or royalty. Improved fire clay charcoal furnace. Just patented. Has proven to be a success. For particulars address, Charles J. Koch, 405 Congress Avenue, Austin, Texas. (jly)

**FOR SALE**—Patent No. 716,603. Issued Dec. 23, 1902. Indexed weighted hand plumb and level. Showing plumb and level or any desired degree of angle required on spaced degree article. Address, J. H. and A. E. Weyandt, Bowerston, Ohio. (jly)

**FOR SALE**—Patent No. 716,465, dated December 23, 1902. Board-Setting Instrument for Laying Flooring. Grand thing for carpenters. Address, Samuel Nicholls, Sr. Kenesaw, Neb. (jun)

**FOR SALE**—Patented Novelty in Toy Tops now on the market. Dies, tools, etc., some stock. Price \$1,500. Address, S. C. Sanborn, 4743 Calumet Ave., Chicago, Ill. (jun)

**FOR SALE**—Part or outright. Newly invented advertising puzzle. Easily manufactured. Costs less than a quarter of a cent. Contains 100 to 1,000 word ad space. Made of cardboard. Flat mailing. Address, A. W. Mundt, Hammond, Indiana. (jun)

**FOR SALE**—Patent No. 719,011, dated January 27, 1903. Range Finder. Will sell outright or lease with royalty. For full particulars address, Alexander Kennedy, Ponoka, Alberta, N. W. T., Canada. (jun)

**FOR SALE**—Patent No. 710,490. Flexible Partitions at a reasonably low price. This device is second to none. The partitions can be raised or lowered at will with utmost ease. For particulars address, W. F. Miller, Box 26, Kenmore, N. D. (jun)

### WANTED.

**WANTED**—A partner with capital to promote patent, manufacture and sell the same. Invention is a Rotary Engine of a new type. For particulars address, J. B. Pollard, Box 343, Roanoke, Va. (jly)

**WANTED**—I would like to hear from some manufacturers of Carriage and Wagon Makers Tools, etc. Address, D. L. Regione, 545 Wieland Street, Chicago, Ill. (jly)

**WANTED**—What have you to offer? Being manufacturers and large dealers in Agents' supplies, we are always looking for fast selling articles. Who has self-heating sad-irons? Address, Voorhees & Centennial, Trenton, N. J. (aug)

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

### A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. The ARMY AND NAVY MAGAZINE, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00



## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America. For rates, address—

The Railway and Engineering Review, 1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,

Send for sample copies. ALLENTOWN, PA.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books.

Wear like leather. FRED. B. NICHOLS & CO.,

913 E. St., N. W.,

Wholesale Stationers, Washington, D. C.

## SELF-EDUCATION FOR MECHANICS.

A Monthly Journal intended as a Guide to Correct Methods in Work and Study.

25c. A YEAR. SAMPLE COPY FREE.

Industrial Publication Co.,

16 Thomas Street, - - NEW YORK.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— The Inventive Age Pub. Co.,

918 F St., N. W. WASHINGTON, D. C.

E. C. WILEY,  
Mechanical - - -

- - - Engineer.

Office 811-1-2 Main Street,

Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.

## ANALYZE YOUR BUSINESS

HYDROGEN is an inert gas.

OXYGEN consumes what it touches.

WATER consisting of two volumes of hydrogen and one of oxygen makes everything grow.

YOUR business, not advertised, would lie dormant.

OUR energies, without an object, would consume themselves.

UNITED our efforts will make your affairs grow more profitable, your operations more successful, and your bank account larger.

CO-OPERATION has always been the slogan of success.

ALL progressive business men recognize this.

NOTHING of importance can be accomplished without it.

GIVING our concentrated attention to increasing the business of each one of our clients by advertising methods suited to his individual case.

REGARDING his affairs as our own and giving him the benefit of our equipment, experience and qualified judgment.

OUR efforts seldom fail to accomplish results desired.

WHEN combined with the good business sense of the man who knows what he wants, and adopts the original, aggressive, exclusive methods of

MAHIN ADVERTISING CO.

200 Monroe St. Chicago.

# RIPANS



The simplest remedy for indigestion, constipation, biliousness and the many ailments arising from a disordered stomach, liver or bowels. Ripans Tablets. They have accomplished wonders, and their timely aid removes the necessity of calling a physician for many little ills that beset mankind. They go straight to the seat of the trouble, relieve the distress, cleanse and cure the affected parts, and give the system a general toning up. The Five Cent packet is enough for an ordinary occasion. The family bottle, 60 cents, contains a supply for a year. All druggists sell them.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,

WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, JUNE, 1903.

### The Value of Patents.

Every once in awhile patent solicitors are asked by their clients for advice as to the value of their patents. No matter how high or low a patent attorney may rate the patent, he is likely to do himself and the inventor a great injustice. Whatever care he may take, his opinion has no greater value than a guess. The best thing for him to do is not to venture an opinion. The value of a patent cannot be foretold in dollars and cents. A patent is worth just as much as the inventor can obtain for it,—no more and no less. This is rather indefinite, but the fact is a patent is an unknown quantity. Its speculative value may be great;—its actual value may be little. Most patents are speculations. Occasionally one sees an invention broadly protected by a patent, the great value of which is manifest at the outset; but as a rule the value of inventions, and patents covering them, must be proved by actual commercial test of the invention in competition with what is on the market. Take as an instance the presses now used for rolling cotton into round bales. One would have supposed that the demand for such machines would be practically unlimited; that no difficulty whatever would be experienced in exploiting the invention. The truth is, after many years labor and an expenditure of much capital, only a small percentage of cotton is baled by the round bale process. This is not due to any imperfection in the method or appliances, but is solely because of the opposition of established or vested interests. Vast sums of money were expended in the erection of compresses used for making the ordinary plantation or square bale, and the influence of the owners of such compresses has been used to fight the introduction of the round bale presses. One might have said at the time the round bale press was first introduced that the invention was worth millions; yet it is a pretty safe guess that the companies

exploiting the presses for making round or cylindrical bales of cotton, have not paid dividends.

One of the most striking instances is that of the Mergenthaler linotype machine. As is well known, a million dollars was expended before the company had succeeded in building a commercial machine. During the period of experimentation, the stock of the company sold much below its par value. Today it is \$80 or \$85 above par value and paying good dividends.

It must be conceded that the formation of huge trusts has done much to depreciate the value of patents. Take the great U. S. Steel Corporation, capitalized at a billion dollars. What does that concern care for patents? They may employ their own attorney and continue to patent their inventions largely through force of habit, but if they should be asked by an outsider to purchase a patent, they are in a position to get it at their own figure, if they want it at all.

We have often been amused at the absurd valuations placed on patents by inventors. An invention which may have cost the inventor a few hours' thought and time, because it has been patented, immediately becomes invested with a fictitious value. We are not disposed to ally ourselves with those who flippantly say that a majority of patents are worthless. What we desire to have distinctly understood is that patents are not worth as much as inventors usually think they are. A patent is not a fortune in itself, though money may be made out of it by good management and the exercise of common sense. If patentees would realize this at the outset and not hold out for fancy prices, there would be more patents sold than is now the case. An inventor in considering the matter ought to look at it in this way: A capitalist can get along without the patent, because he has lived without it up to the time of the creation of the invention. The inventor, however, cannot make any headway without the money of the capitalist, and inventions of themselves have no value until after they have been put on the market and much money spent in exploiting them.

### SELLING PATENTS.

#### Some of the Schemes.

Of the many plans which have been resorted to for the purpose of obtaining money from inventors, that of selling patents seems to be the most prolific in the matter of the invention of new schemes. At present, the plan which seems to meet with the most success is that adopted by a concern in New England. They write to an inventor offering him a certain sum of money for his patent, say from \$2,000 to \$5,000. In most cases, the inventor accepts the offer. The concern then states that before the deal can be consummated, they must have an opinion as to the validity of the patent; that if the report is favorable, the deal will be carried through, and if a patent expert declares that the patent is invalid, the proposed sale will have to be dropped. The concern is careful to state, however, that an opinion by

the attorney who took out the patent will not be accepted, but the report must be made by an attorney of their selection and usually his name is given.

Some inventors are clever enough to see through the scheme, while others are not. It should be plain even to the uninitiated that the concern referred to is in league with the attorney in the matter of securing business, and that the attorney and the company divide whatever fee is charged for the preparation of an opinion. Usually from \$25 to \$100, and even as high as \$200 has been charged for the examination and report as to the validity of a patent. It is not surprising that many inventors are caught, for who would not pay out \$200 for an opinion in the hope of making from \$2,000 to \$5,000 through the sale of a patent. The attorney selected invariably reports that the patent has a limited scope or is an infringement of some other patent, as a result of which the concern withdraws its offer, or makes a counter one considerably less than the first proposition.

Another method is adopted by a party in Indianapolis, who offers to make "working drawings" for inventors at so much an hour. He writes a circular to the inventor calling his attention to the fact that the drawing of his patent is not a working drawing, and stating that in dealing with manufacturers the inventor will need a working drawing to show up the invention in its best shape. As a matter of fact, though, manufacturers of any standing have their own draftsmen, and when they take a job they prefer to make their own working drawings because the draftsman can then work in conjunction with the patternmaker. However, inventors do not know this, and the Indianapolis party profits by the ignorance of the patentees. Should the inventor be so foolish as to send him money, he is advised that the work will be charged for at so much per hour, and at the end of several weeks he is notified that more money is needed. The party is very careful to call for only \$5 or \$10 at a time; hence, before the inventor knows it, he has sunk \$50 to \$100 and the work is still in an incomplete state. If the inventor should show any degree of impatience with the results, he is advised that in the construction of the working drawings of his invention, certain improvements have been made, and the improvements are of such radical nature that they are not covered by his patent. He is advised to patent them, and the party states that he will attend to procuring a patent for a certain sum. If the inventor refuses to bite at this, then he is further advised that if he does not consider the improvements of sufficient value to secure a patent thereon, that he (the Indianapolis man) will apply for the patent himself and manufacture the invention or sell the patent to some other person. About this time the inventor gets mad and tumbles to the fact that he has been the victim of a game of confidence. Strange to say, this thing has been going on for years, and there appears to be no way of stopping the schemer whose idea is to "work" the

inventor by a plan of making "working drawings."

Still another scheme is for a party to write to a patentee offering to sell his patent, provided he (the patentee) will furnish him with an abstract of title, and the suggestion is made that if the inventor cannot obtain an abstract, he (the writer) will secure it for a certain sum, say \$5. Quite often the inventor, not being able to obtain the abstract himself or not caring to go to the trouble of securing it, sends the \$5 to the party, and the deal is closed so far as the swindler is concerned and the inventor never hears from him again. All he wanted was \$5 for the abstract, and when he got it, he put it in his pocket and turned his attention to other inventors.

There seems to be no way of keeping inventors out of the hands of these scoundrels. While the postal officials occasionally get after them and debar them from the use of the mails, they start up again in some other city under a new name and continue their former practices. The Postmaster-General cannot act without proof, and it takes months to obtain it, during which time inventors are sending \$5 from all portions of the country every week to keep the mill going. Nearly every solicitor of patents warns his clients against having any dealings with such people; but no matter how often the warnings are repeated, inventors seem to be credulous, as a class, and are easily taken in by the various offers and propositions which are sent to them.

The inventor usually supposes his trouble ends when he gets his patent. As a matter of fact, judging from the experience of inventors in the past, and in the light of the preceding remarks, many of their troubles do not begin until that time.

### The Cheapening of Artificial Light.

A London paper recently propounded the question, "Why is it that the electric light has not become more popular and consumers are still in a small minority?" Artificial light is one of the necessities of life. It is conceded that electric light is by far the best, yet it has not reached the homes of the common people. To some extent this is due to the initial cost of wiring and fitting up, as a temporary tenant is loath to incur such expense. Arrangements have been made in some instances by electric companies by which the user has been enabled to hire the use of wires and lamps, but consumers have not exhibited any great eagerness to pay rental for such things.

Quite recently the system of absolutely free wiring has been tried with encouraging results. There would seem to be no reason why this practice should not be continued. The installation of the electric light should not involve any greater expense than the putting in of a telephone. Telephone companies never think of charging the user with the expense of wiring his premises, and companies who have electricity to sell should be equally accommodating in the matter of extending their service.

The greatest obstacle, though, is the



matter of price, and in this the opinion of engineers rather than business men seems to have been taken. It should be left to the engineer to calculate what it costs to produce electricity. The business management of the company with the cost before them should find means of selling the current to the best advantage. This dual arrangement could be carried on without any conflict of interests or opinions between the two departments. It is the function of the engineer to generate cheaply, and of the business manager to control the total revenue without interfering with the efforts of the engineer. The dominant idea of both is obviously to keep the machinery at work as many hours a day as possible. The plant is there, it has cost a good deal of money, and it depreciates almost as rapidly when it is idle as when it is running. Why then is not some method devised to decrease the expense of wiring and also lessen the cost of producing the current?

The ideal system would embrace an individual plant for each house, and at present this involves great expense. In this way the entire city would not be dependent for light on the operation of a central plant. Each residence would have its own apparatus for generating the current. It was supposed that acetylene would meet the want. To some extent it has, since it furnishes for each home a clear, white light of great power and at a comparatively low cost. The principal objection to acetylene is due to the dangers from explosion, for not every householder has sufficient mechanical ingenuity to run an acetylene gas generator under all conditions of service without danger to himself and family.

The Welsbach mantles have certainly popularized, in recent years, the use of gas. Indeed, if it were not for the incandescent mantles, gas would have fallen more rapidly into disuse than it has. It was freely predicted, at the time of the first introduction of electric light, that the use of gas was doomed. If it had not been for the invention of the Welsbach mantle, and the failure of electrical engineers to keep in touch with the progress of the times by the construction of apparatus which would enable electric light to be used by small consumers with safety and profit, the production of gas from coal would be on the wane today.

Who knows, though, what the future may bring forth in the way of the discovery of some new source of light, or the generation of electricity from elements which will cheapen it so as to universalize its use.

#### New Trolley Pole.

Messrs. Charles A. Bray and Florian C. Fry of Schenectady, New York, have patented a trolley pole and have assigned their entire interests therein to the General Electric Company. The pole is intended more particularly for use on mining locomotives which traverse contracted passages. The main tunnels of a mine are frequently very narrow or of considerable depth, while other passages may be shallow and broad. This is especially true of coal mines where the

chambers are of a depth equal to the thickness of the seams. The object of the invention is the construction of a pole which will adjust itself to contact either with a conductor above the vehicle carrying the pole, or at one side of the same and at a level with or below the top of such vehicle. The pole is revolvably mounted on the locomotive in the usual manner and is made up of sections. The first section is preferably constructed of wood and is clamped in a socket pivoted to the trolley base. The second section is of metal tubing and has a straight portion receiving the end of the pivoted section. Another portion of this section, which is substantially parallel to the inner portion, is connected thereto by an intermediate angular offset. At the outer end of the pole is secured the trolley wheel holder or bracket, which may be of the ordinary construction or swiveled on the pole. A pole as thus constructed will engage the conductor above the locomotive in the ordinary manner, or will assume a position at one side of the vehicle and at a level with, or lower than, the top of the same.

#### Electric Welding Process.

Messrs. Joseph Schurek and Franklin B. Giesler, residents of Milwaukee, Wisconsin, have recently obtained a patent on a method of electric welding, the invention having a special reference to the welding together of articles presenting different areas of surface at different welding points. For instance, in welding the two parts of a steel link, the side members of which are of unequal size, they proceed in the following manner:

A pair of electrodes in the form of presser-blocks, which are shaped to conform to the shape of the articles to be welded, are arranged so that they may be simultaneously forced towards each other or separated. The two parts of the link are supported between these electrodes or presser-blocks, and a thin non-conducting plate of glass, gutta-percha, or the like is interposed between the welding points of least area. The current is then turned on, and the presser-blocks forced towards each other. This pressure is maintained until the larger ends of the links, which are brought together, are welded. The pressure is then released momentarily, without cutting off the current, and the non-conducting plate withdrawn, whereupon the pressure is instantly restored to bring the smaller welding points into contact. The current will immediately weld these parts. Without the use of an interposed body of non-conducting material at the smaller points, it would be impossible to successfully perform the operation of electric welding with an article presenting extreme differences in the areas of surface at different welding points, for the reason that the electric current would burn or fuse away the metal at the smaller areas before the welding could be accomplished between the contacting surfaces of greater areas; but by carrying out the present invention, this difficulty is entirely overcome.

#### Metallic Packing.

Edward James of Pittsburg, Pennsylvania, has assigned to the Hileman-James Company, also of Pittsburg, a patent on an improvement in metallic packing.

The composition consists of metallic pellets and graphite, together with a suitable non-greasy binding material. Preferably the pellets are composed of tin, aluminium, copper, and antimony, forming what may be called an "aluminium Babbitt metal." The graphite may be in the powdered or in flaky condition, or both forms may be united. The binding material is preferably pure beeswax free from grease, though other kinds of non-greasy wax may be used. The wax is melted and thoroughly mixed with the graphite by any suitable means. When the mixture becomes cold, it forms a more or less hard mass that does not soil the fingers as a greasy mixture does, and that may be easily subdivided and placed in stuffing-boxes.

Although the composition may be formed into a mass adherent throughout the whole, it is preferable to form the same into separated pellets each having the three ingredients above described. The pellets are of sufficient hardness to prevent their amalgamation while handled or transported, and yet are pliable enough to readily yield to the pressure of glands, so as to fill stuffing-boxes completely.

In use there is poured into the stuffing-box a sufficient number of coated pellets to fill the same to the desired height, after which the gland is screwed down. The pressure of the gland causes the pellets to yield and form an adherent mass, which adjusts itself to the shape of the piston-rod and stuffing-box, forming a joint which is air, steam, or water tight. No material adheres to the piston-rod, and therefore the contents of the stuffing box is not carried off, as is the case with greasy packings.

#### The Kitchen as a Laboratory.

The mistress of the home of 1925 will be a chemist. She will be a trained scientist. She will regard her kitchen as a laboratory in which a thousand wonderful experiments will be tried. The idea that the kitchen is a place of drudgery, where only those enter who are forced by circumstances, will have disappeared; and there will remain only wonder that any one could ever have been ignorant enough of the marvelous processes of science to have taken so little interest in the subject.

The kitchen itself will disappear from the basement and from the home forever. In its place, adjoining the dining-room, so that the transit from the fire to the table may occupy but a second's time, will be the "Household Laboratory." The mistress of the house and her daughters will find no more interesting period of the day than that which is spent in the well-lighted, well-ventilated, cleanly and comfortably arranged room given up to the constant surprises which science offers to those who will study with interest her wonders in the realm of combinations of food materials, and the transformations brought about by varying degrees of heat.—*Cosmopolitan*.

#### The First Locomotive in England.

While it is a matter of history that the first locomotive made and run in England was the little model of an ordinary road locomotive constructed in 1784 by William Murdock, it is probably little known that this original engine is still in existence, and has, within the past year, been on exhibition in London. The little locomotive is about 14 inches high and 19 inches long, with a width over the driving wheels of 7 inches. It consists of an oblong board, mounted upon three wheels, with two driving wheels at the rear attached to a crank axle, and one steering wheel in front arranged under the board, and running in a swiveling fork, which can be set by a tiller handle above. Behind the driving wheels is the boiler—a rectangular copper vessel, through which a flue passes obliquely, contracting from a circular chamber forming the fire box to a small funnel in the top of the boiler, which serves to carry off the products of combustion from a spirit lamp, arranged to burn within the fire-box. The steam cylinder of the engine is mounted on the top of the boiler and the lower part passes into it, and is surrounded by steam. The piston rod passes upward, and is attached to the end of a vibrating beam, which passes to the front of the carriage and is pivoted in an upright pillar. The diameter of the piston is  $\frac{3}{4}$  inch, and the length of its stroke is about 2 inches. As the piston moves up and down, it causes the beam to rotate the driving wheels by means of a connecting-rod attached to the crank axle. A leaden weight is placed above the steering wheel to balance the machine, and to prevent it tipping over when water is in the boiler.

It may not be amiss here to repeat the brief account, frequently referred to in the past, given by Dr. Smiles, in his "Lives of the Engineers," of Murdock's early trials with his little engine. He had made several experiments with it in his house at Redruth; but at length he determined to try it out of doors, on which occasion, small as the engine was, it fairly outran the speed of the inventor. In Dr. Smiles' own words, "one night, after returning from his duties at the mine at Redruth, Murdock went out with his model locomotive to the avenue leading to the church, about a mile from the town. The walk was narrow, straight, and level. Having lit the lamp, the water soon boiled, and off started the engine, with the inventor after it. Shortly after he heard distant shouts of terror. When he came up to his machine he found the vicar in great fear, thinking that the hissing, spitting little demon was no other than the Evil One himself." When James Watt, with whom Murdock was associated in some of his work, heard of Murdock's experiment, he became alarmed that Murdock's energies might be distracted from the business of stationary engines in which they were engaged, and he requested his partner, Boulton, to remonstrate gently with Murdock and get him to drop the project. Accordingly Murdock did so, never taking up the subject again. The model has been continuously in possession of the Murdock family until 1883, when it was purchased from Murdock's grandson by Messrs. Tangye, of Birmingham, and lent by them to the Melbourne Exhibition of 1859. Subsequently it was placed in the Birmingham Art Gallery, where it remained up to the time of its recent exhibition in London.—*Cassier's Magazine*.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued May 5, 1903.

### MECHANICAL PATENTS.

- Adding machine..... J. L. Levin  
Agricultural implement..... AM. O. Schreiber  
Air brake..... J. Lipkowski  
Air brakes while set. Means for supplying fluid pressure to the auxiliary reservoirs and brake cylinders of..... E. G. Shortt  
Album..... A. Swanson  
Album and stand, Combined..... N. H. Jones  
Amalgamating device..... G. C. Scott  
Anchor, Sea..... T. S. Miller  
Animal trap..... C. C. Bowen  
Apron and hood, Combined storm..... J. P. Gordon  
Arch construction..... J. A. Drake  
Armature winding apparatus..... F. P. McBerty  
Artillery. Armored shield for traveling..... E. von Reichenau  
Asphalt composition and its manufacture..... F. J. Warren  
Asphaltum and its manufacture..... F. J. Warren  
Atomizer..... C. Bomeisler  
Augur, Earth..... N. Erziz  
Automatic switch..... O. McNorton, Jr.  
Automobile..... C. B. Mills et al  
Automobile jack..... G. W. Bartlett  
Awnings. Means for operating roller..... A. L. Clark  
Axle spindle protector..... C. H. Smith  
Badge and boutonniere holder, Combined..... A. P. W. Neithercott  
Bag making and filling machine..... A. H. Phillips  
Bailer..... L. Jones  
Bails. Device for handling vessel J. McMahon  
Baling press..... G. E. Maxwell  
Balls. Making playing..... E. Kempshall  
Bandage. Catamenial..... S. P. Langdon  
Bank. Coin..... O. Burns  
Barber's cabinet..... L. Harrison et al  
Barber's chair shampooing attachment..... M. & H. Romans  
Bat. Base ball..... C. F. Held  
Bearing. Antifriction..... A. E. Henderson  
Bearing. Roller side..... A. G. Steinbrenner  
Bed bottom supporting frame..... J. H. Dyett  
Bed. Invalid..... W. C. Sennett  
Bed spring..... A. E. Beall  
Bicycle..... B. F. Modisett  
Bicycle supporting bar..... G. Spence  
Blast furnace..... N. Erziz  
Board machine..... C. E. Frye  
Boats. Combined ventilating and observing tube for submarine..... S. Lake  
Boats. Stowing and lowering or raising..... F. H. Wadsworth  
Boiler water regulator. Steam..... B. Walker, Jr.  
Bolt head milling machine..... B. F. Paist  
Book. Car report..... F. M. Lucore  
Bookbinder's vise..... A. H. Whiteside et al  
Bookcase door. Sectional..... F. Macey  
Bottle. Non-refillable..... J. Saviole  
Bottle. Non-refillable..... S. Wilkinson  
Bottle. Non-refillable..... S. M. Cawker  
Bottle stopper..... W. B. Langan  
Box..... H. H. Belknap  
Box and cover therefor..... C. J. Sundstrom  
Brake..... U. de Civy  
Brake apparatus..... F. L. Clark  
Brake apparatus. Automatic fluid pressure..... 2 pats. G. Westinghouse  
Brake beam..... 3 pats. L. A. Shepard  
Brake fitting..... O. Witmore  
Brake shoe..... W. E. Steinhauer  
Breech cloth supporter..... H. G. Northfield  
Brick machine..... A. L. & M. T. Symmonds  
Brick manufacturing apparatus..... 2 pats. E. Eaton  
Bricks. Manufacture of..... S. T. H. Bradley  
Bronze powder. Manufacturing..... K. Huth  
Brooder..... C. Staaff  
Brush..... W. P. Van Loan  
Brush..... J. R. Grundy  
Brush. Rotary..... H. R. Atwater  
Buckle..... R. A. Brown  
Buffer..... T. Robinson  
Building construction. Sidehill..... G. C. Scott  
Burial casket..... J. P. Brady  
Button, &c., fastening..... C. Weaver  
Button. Separable..... L. G. Kunze  
Calcining furnace..... C. T. Hennig  
Calcining or decomposing furnace..... W. Hasenbach  
Calcium carbid refuse and product thereof. Utilizing..... G. E. Cox  
Calculating device..... W. T. Williams  
Calendar..... M. O'Marra  
Calendar press..... F. H. Turner  
Camphidin and preparing same..... J. Tafel  
Camphidin. Manufacture of..... J. Tafel  
Cane..... J. L. Brink  
Car brake..... M. J. Doner  
Car brake..... F. W. Rock  
Car coupling..... P. T. Handiges  
Car coupling..... J. G. L. Myers  
Car door..... W. Thornburgh  
Car draft gear, Railway..... A. Stucki  
Car draft rigging..... H. T. Krakau  
Car. Dumping..... S. F. Swanson  
Car fender..... J. P. Clark  
Car. Railway..... S. F. Swanson  
Car wheel. Mine..... E. E. McConnell  
Cars or other outside places. Seat for use on tram..... D. B. Foster  
Carbureter. Gas engine..... A. Peteler  
Carbureting apparatus. Air..... T. H. J. Leckband  
Carriage. Traction..... I. S. Freeman  
Casting apparatus. Ingot..... A. J. Lustig  
Casting apparatus. Metal..... R. W. Davies  
Castings. Making..... J. C. Davis  
Casts. Photomechanical process of producing finished and plastic..... C. Pietzner  
Catch..... E. G. Schriefer  
Cathode holder..... J. Mathews et al  
Celery shaving device..... J. F. Luhrman  
Centrifugal separator..... O. Anderson  
Chain tightener..... E. W. Burgess  
Chair..... E. A. Farish  
Check row wire anchor..... F. Haack  
Churn..... N. J. Tubbs  
Churn..... J. W. Connitt  
Cigar and mouthpiece therefore..... J. Kraus  
Circuit closer..... W. J. Bell  
Circuits. Regulation of alternating..... T. J. Johnston  
Clasp or fastener..... A. P. Lewis  
Clip..... L. C. McNeal  
Clock hand setting mechanism..... T. Schaffer  
Clothes line reel..... J. P. Sundin  
Clutch..... P. J. Shouvin  
Clutch apparatus. Frictional G. W. Starr et al  
Coat hanger..... J. J. Fuller  
Coats, hats, &c. Lock hanger for..... J. C. Backus  
Cock. Gage..... F. D. Philp  
Coin controlled apparatus..... H. P. Gillette  
Comb..... T. Douglas  
Concrete building blocks. Machine for molding hollow..... 2 pats. H. S. Palmer  
Condenser..... W. T. Lemau  
Condiment holder..... J. W. Graeme  
Conveyer..... R. H. Gray  
Copy holder..... S. C. Hoyle  
Copying press..... L. Bailey et al  
Core forming machine. Sand S. C. Weeks et al  
Core making machine..... H. E. Pridmore  
Corking machine..... A. A. Pindstoffe  
Corn husker and shredder..... C. E. Curtiss  
Corn shocker..... 2 pats. O. S. Ellithorp  
Corner bead. Plasterer's..... L. Schuller  
Cornice jack..... J. W. Thomas  
Corset..... D. Kops  
Crate. Knockdown..... G. M. Kertz  
Cream separator. Tubular..... J. C. & A. D. Frederick  
Creel..... G. Ohleyer  
Crematory for garbage or like substances..... F. P. Smith  
Crowbar..... M. F. Cahill  
Crushing rolls..... J. H. Montgomery  
Cultivator..... W. J. Wiswall  
Cultivator..... G. W. Whitehurst  
Curbing. Metal bound..... H. H. Wainwright  
Curling iron. Electric..... M. Shepherd  
Current machinery. Means for avoiding hunting of alternate..... H. C. Leake  
Current motor. Alternating..... F. P. McBerty  
Curtain fixture..... H. E. Keeler  
Curtain pole attachment..... M. J. Steckman  
Curtain pole bracket..... J. A. Larson  
Curtain rod bracket. Sash..... A. L. McCarty  
Cushion..... C. R. Burdick  
Cushion tired wheel..... M. Halfpenny  
Cutter guard..... F. L. Forster  
Damper mechanism. Time..... J. N. Crocker  
Damper. Stove..... W. G. Montgomery  
Dental mouth mirror..... C. S. Street  
Dental mouth mirror attachment..... D. C. Franklin  
Desk..... A. F. Wernicke  
Desk and type writer cabinet. Combined..... J. Gramelspacher  
Desk. School..... J. W. H. Piner  
Disks. Machine for producing apertured..... G. A. Ensign  
Display frame for show windows..... J. B. Allen  
Door check..... W. T. Adams  
Door closing mechanism. Automatic..... W. A. Cross  
Door fastener. Sliding..... L. Coin  
Draft attachment..... F. W. Riedler  
Draft rigging..... H. T. Krakau  
Draining or sewerage system..... J. G. Richert  
Drier..... J. Waterhouse  
Dry closet system..... J. Danner  
Drying rack..... I. L. Gleason  
Drill press reversing mechanism..... H. R. Isler  
Drill socket driver..... C. C. Roberts  
Drinking vessel..... W. A. Scott  
Driving mechanism for motor driven machinery. Reversible..... F. T. Currier  
Dust collector..... F. Prinz  
Dust guard..... J. J. Koller  
Dye and making same. Blue..... H. Laubmann  
Dye and making same. Blue sulfur..... E. Kraus  
Dyeing and printing in anilin black..... F. Cleff  
Electric accumulator plate..... D. Tommasi  
Electric battery for body wear..... R. Wingren  
Electric conductor or cable..... F. Tremain  
Electric furnace..... J. M. Carrere  
Electric light hanger..... J. P. Heberdahl et al  
Electric switch..... V. Royle  
Electrical switch..... J. L. Steeb  
Electrical distributing system..... L. Andrews  
Electrical outlet box..... H. Krantz  
Electrolytic and mechanical interrupter. Combined..... H. R. Smith  
Electrolytic processes. Apparatus for continuous practice of..... P. G. Salom  
Electromagnetic wave receiver..... 2 pats. R. A. Fessenden  
Elevating and supporting weights. Device for..... E. Hornaday  
Elevator hoisting mechanism T. W. Heermans  
Elevator well door..... W. A. Cross  
Engine..... W. E. Kichline  
Engine igniter. Gasoline..... J. McCluer  
Engine incandescent igniter. Gas..... J. S. Lang  
Engine mixer. Explosive gasoline..... G. W. Starr et al  
Engine sparking igniter. Explosive E. Maerky  
Excavating cutting machine..... T. E. Daniels  
Explosion engine..... M. H. Rumpf  
Explosive and making same M. W. Beardsley  
Explosive charge..... L. Gathmann  
Extension table..... J. F. Arnold  
Extension table..... H. Borgmann  
Fabric finishing machine..... M. Ratignier et al  
Fabric folding machine..... A. Dauvergne  
Farm gate..... J. T. Yager  
Fastening device..... W. F. Keyes  
Faucet coupling..... C. T. White  
Feed box. Time..... W. I. Baker  
Feed water regulating means..... J. N. Stephens  
Fence..... I. N. Williams  
Fence wire clamps. Implement for applying and clenching..... G. H. Wright  
Fence wire staple..... R. A. Winters  
Film holder..... J. Becker  
Filling and indicating device. Liquid..... J. W. Johnson  
Filter..... G. W. Johnston  
Fire alarm. Thermal electric..... T. B. & F. A. Duncan  
Fire escape..... T. May  
Fire escape..... D. Ward  
Fire extinguisher..... J. M. Miller  
Fires. Device for facilitating the rebuilding of..... E. E. Moser  
Firearm. Automatically cocking..... E. Roth  
Firearm sight..... J. T. Brayton  
Fireproof building construction..... E. P. S. Wright et al  
Fireproof floors, &c. Construction of..... J. A. Holmboe  
Flying machine..... O. A. Kaehler  
Folding machine..... E. Drake et al  
Food chopper..... M. A. Rollman  
Food chopper..... M. Griswold, Jr.  
Foot. Artificial..... G. F. Ehrle  
Form. Dress..... A. E. Scott  
Friction coupling..... A. Leikem  
Fuel feeding device..... L. K. Davis  
Furnace..... W. D. Zehnder  
Furnaces. Automatic charger for busheling..... J. W. Arnold  
Furnaces. Conveyer and shield used in connection with crucible smelting..... P. J. McDonald  
Galvanic battery. Reversible..... T. A. Edison  
Game apparatus..... A. Reed  
Garment..... G. Boxley  
Gas burner..... A. E. Hartel  
Gas burner..... A. Bachner  
Gas fixture..... H. M. Daggett  
Gas generator..... A. Langen  
Gas lighting and heating apparatus. 3 pats. C. W. Hinman  
Gas. Purifying..... J. A. Bellon-Lencachez  
Gas. Purifying..... (called J. A. Lencachez) G. Metzger  
Gas regulator..... G. Metzger  
Gases into bath fluids. Device for introducing..... L. von Orth  
Gasoline burner. Vapor..... H. M. Burnell  
Gauze substitute..... R. W. Johnson  
Gear shipping mechanism..... E. W. Burgess  
Gearing. Compensating..... E. Huber  
Glass manufacture. Meshed wire for wire..... F. & A. Shuman  
Glass. Manufacture of wire..... 3 pats. F. & A. Shuman  
Globe..... E. N. Todd  
Gold dredger..... O. F. Barnes  
Golf club..... C. M. Burnam  
Golf or other club..... J. D. Dunn  
Governor..... E. T. Sederholm  
Gramophone or phonograph..... H. Jones et al  
Graphophone reproducer..... W. Hart  
Grinding machine..... Z. R. Tucker  
Grinding rolls..... T. A. Edison  
Gun boring and burnishing machine..... T. C. Histed  
Gun. Powder..... C. B. Riker  
Hame attachment..... I. Frank  
Hame fastener..... G. W. Rayer  
Hammer. Power..... G. E. Davis  
Handcuff attachment..... J. W. Pettijohn  
Harrow..... L. W. Compton  
Harvester compressor and top retainer. Corn..... E. W. Burgess  
Harvester. Corn..... E. W. Burgess  
Harvester divider attachment..... E. J. Birkett  
Harvester frame. Corn..... E. W. Burgess  
Hat fastener..... J. W. Edgerton  
Hay derrick..... T. De La Mare  
Hay rake. Horse..... L. O. Knapp et al  
Heater..... E. P. Clapp  
Heating apparatus..... F. F. Meinzer  
Hinge. Lock..... E. Cornberg  
Hitching device..... G. W. Cummings  
Hitching rack. Folding..... C. W. Justus  
Hoisting device..... M. Rath  
Hook and eye..... J. W. Edgerton  
Horse blanket..... G. A. Bulles  
Horse detacher..... J. A. Donaldson  
Horse detacher. Vehicle..... J. S. Fischer  
Horseshoe..... F. T. Giles  
Horses. Apparatus for stopping runaway..... H. G. Muck  
Hose coupling..... T. & S. Strba  
Hose supporter..... P. S. Bauer  
Hydroxylamin. Producing..... J. Tafel  
Ice. Apparatus for the manufacture of..... L. Block  
Ice cream freezer..... E. Walker  
Ice machine..... A. Peter  
Incubator heater..... O. P. Scott  
Index. Card..... D. F. Taber  
Index locking device. Card..... C. McPike  
Insoloxyl. Making..... A. Bischler  
Insulator. Electric wire..... J. R. Bell  
Iron. Manufacturing electrolytically active finely divided..... T. A. Edison  
Ironing table..... J. Gray  
Jail..... O. W. Becker et al  
Jar neck and closure..... A. Smelker  
Jewelry fastener..... J. Pejchar  
Journal bearing. Self oiling..... G. A. Ensign  
Kettle or like utensil..... J. E. Tonks et al  
Knee protector..... M. M. White  
Knitting machine..... L. N. D. Williams  
Knitting machine electric stop motion..... A. L. Patterson  
Knitting machine take up mechanism..... R. W. Scott et al  
Knotter..... O. W. Orell  
Label moistening machine..... C. Freihofer et al  
Lace fastener. Shoe..... L. Van Orsdale  
Lacing..... E. A. Young  
Ladder..... L. B. Baker  
Ladder brace, step fastener, and support combined. Step..... H. A. Williamson  
Ladder, clothes rack, and table frame. Combined step..... J. Gray  
Lamp. Electric street car..... C. C. Benson  
Lamp hanger. Adjustable incandescent..... P. P. Keller  
Lamp. Incandescent..... J. W. Howell  
Lantern holding device..... J. B. Allen  
Latch. Gate..... D. C. Heston  
Latch. Gate..... G. F. Thompson  
Lathe cutting tool..... E. H. & R. G. Rabiger  
Lathe grinding attachment..... A. R. Grever et al  
Laundry apparatus..... H. Budd  
Leaching tank filter..... F. G. Underwood  
Life preserver..... J. A. Elenius  
Life preserver..... E. Recordon  
Lifting jack..... W. J. Lockhart  
Lifting jack for vehicles. Spring..... O. E. Payne  
Limb joint. Artificial..... E. Koerber  
Linoleum products. Making double layered..... L. W. Seeser  
Liquid fuel burner..... R. G. Kirkwood  
Locket..... J. E. Potter  
Locomotive boiler..... S. Stoianoff  
Locomotive tires, &c. Boring mill for..... I. E. McCracken  
Logging dog or hook..... C. J. Young  
Logging or tie handling tongs..... E. E. Brindos  
Loom. Filling replenishing..... J. Northrop  
Loom. Filling replenishing..... A. E. Stafford  
Loom for weaving pile fabrics..... M. J. Whittall  
Loom let off and take up mechanism..... H. A. Bond  
Loom shuttle. Self-threading..... J. Northrop  
Loom undermotion..... G. J. Tharan  
Looms. Electrical jacquard mechanism for..... J. Szczepanik  
Mail box..... J. B. Reintges  
Mail delivery apparatus. Rural. O. S. Mallow  
Mailing tube. Paper..... A. W. Ferres  
Malt turner. Machine..... B. W. Ellison  
Mandrel. Expandable..... G. H. Shattuck et al  
Manure spreader..... O. L. Stadig  
Marksman's indicator and recorder combined..... E. G. Wallace  
Mask..... G. L. Merrell  
Match box holder..... J. J. De Long  
Match machine..... H. C. La Flamboy  
Match making machine..... J. C. Donnelly  
Match striker..... E. C. H. Behrens  
Matrix truing apparatus..... K. C. Hansen  
Mattress filling machine..... H. Eckerson  
Measure. Liquid..... H. J. & J. C. Brantley  
Measuring instruments. Index needle or pointer for electrical..... E. Weston  
Measuring wheel or traveler..... A. S. Nunemaker  
Mechanical movement..... J. Hellwig  
Mechanical movement..... T. B. Dooley  
Metal cutting tool..... G. J. Capewell  
Metal, minerals, &c., without digging. Apparatus for locating..... F. H. Brown  
Metaphone..... F. S. Herrmann  
Milk wagon cabinet attachment..... W. A. F. Uhlenhaut  
Millstone..... P. P. Lacey  
Mine model or exhibit..... N. P. Hill et al  
Motor..... H. Gillette  
Motor..... T. H. Pettengill  
Motor controller..... W. B. Potter  
Mower draft connection..... E. W. Burgess  
Mucilage holder..... A. J. Park  
Music holder..... U. C. Terwilliger  
Musical instrument..... F. H. Watson  
Musical instrument pneumatic action..... F. W. Hedgeland  
Necktie rack..... S. W. Bonsall  
Needle..... A. W. Stinson  
Nut lock..... M. Stewart  
Nut lock..... P. L. Kimball  
Nut lock..... J. A. Duffy  
Nut lock..... W. A. Lewis  
Nut lock..... F. Riffle  
Nuts. Bleaching..... H. J. Hoffmayr  
Oats hulling machine..... S. E. Field  
Oil burner..... J. McDermott  
Oil burner. Crude..... T. A. Hartung  
Oil burning apparatus..... J. McDermott  
Oil can..... W. J. Donnelley  
Onion setter..... I. McCollister  
Ore roasters. Rabble arm and connecting device for central shafts in..... E. A. Sjostedt et al  
Ore roasting and smelting furnace..... A. W. Catton  
Ore separator. Centrifugal..... G. Land  
Ore treating apparatus..... H. Hirsching  
Ore treating apparatus..... T. L. Rankin  
Ores of the rare metals. Treating rebellious..... W. F. Downs  
Ores. Treating refractory..... R. McKnight et al  
Oven. Baker's..... W. Kosicky  
Oven. Portable..... F. Listerman  
Ovens with crude petroleum. Mechanical device for heating bakers..... C. E. Warren  
Ozone generator..... G. L. Curtis  
Packing. Cylinder and piston..... J. E. Douglas et al  
Packing rods, &c. Device for..... H. Leutz  
Packing. Stuffing box..... K. Arnold  
Packing trolley valves. Device for J. D. Sturtz  
Painter's elevator..... E. H. Murphy  
Paper bag machine..... E. E. Claussen  
Paper bag machine..... F. Tyson  
Paper box machine..... C. C. Lorgion  
Paper clip..... C. Glover  
Paper damping machine..... M. Johnson  
Paper machine..... J. B. Hanscom  
Paper making machinery..... A. Outerson  
Pavement..... 2 pats. F. J. Warren  
Pavement or roadway. Street sheet. 2 pats. F. J. Warren  
Pavements. Apparatus for constructing asphalt..... H. W. Laster  
Pavements on roadways. Constructing and laying street..... F. J. Warren  
Pavements. Renewal of old street F. J. Warren  
Pea or bean shelling machine..... E. J. & J. M. Foster  
Peanut roaster..... A. J. Daniel  
Pen. Fountain drawing or ruling W. C. Pettie  
Pencil rubber tip attachment. Lead E. U. Mack  
Phonograph..... C. C. Shigley  
Photographic film. Flexible..... P. B. Cady  
Photographic light screen..... T. Willis  
Piano. Automatic..... R. W. Pain  
Piano mandolin attachment..... F. L. Barnard  
Piano touch regulator..... M. Goggan  
Pie crimper and trimmer..... R. H. Berkstresser  
Pin protector..... O. Sherman  
Pinwheel support..... J. E. Benedict  
Pipes. Machine for manufacturing screw threaded..... E. T. Greenfield



Planter.....J. P. Caldwell  
Planter attachment. Corn.....W. Hensler  
Planter. Corn.....L. P. Graham  
Planter seeding mechanism. Corn J. E. Berling  
Planters. Device for exhibiting the operation  
of corn.....W. S. Graham  
Platen press.....O. Pilz  
Platen press. Four color.....J. N. Deppert et al  
Playing ball.....5 pats.....F. H. Richards  
Plover.....S. V. Jeffords  
Pneumatic despatch tube systems. Switch  
fitting for.....H. J. Hert  
Pocket shield.....A. Bernstein  
Post.....L. C. Fisher  
Pressure exerting machine.....G. W. Greenwood  
Pressure generator.....G. E. Blake et al  
Printing machine. Platen.....F. Waite  
Propeller. Counter gravity screw C. A. Manker  
Propeller shafts by electrolysis. Means for  
prevention of weakening.....2 pats.....  
.....A. A. Knudson  
Pruning implement.....J. Barrett  
Pulley. Belt.....P. Medart  
Pulp engine knife fastening.....M. A. Mills  
Pulp grinding machine. Wood.....  
.....C. Schmitthenner  
Pulverizer.....H. Ariens et al  
Pump. Air.....F. Edwards  
Pump. Clay cutting sand.....A. J. Bramlette  
Pump. Double cylinder sinking.....E. M. Coryell  
Pump operating mechanism D. J. Nysewander  
Pump or motor applicable also as a fluid meter.  
Rotary.....E. N. Gulich  
Pump regulator.....A. A. Ball, Jr  
Pump rod coupling.....C. J. Le Valley et al  
Pump. Rotary.....A. Mayer  
Pyrographic work. Tool for Z. N. Tyssowska  
Railway. Electric.....C. A. Thompson  
Railway fog signal apparatus.....H. F. Clayton  
Railway rail.....G. A. Case  
Railway spike.....J. H. Duffy  
Railway switch protector.....L. R. Rogers  
Railway switches. Automatic operating mechan-  
ism for electric.....G. W. Johnston  
Railway tie.....J. S. Miller  
Railway tie plate.....D. O. Ward  
Railway tie tamping machine.....E. C. Springer  
Range furnace, &c. Cooking.....J. J. Cartwright  
Rattle.....L. J. Bailey  
Refrigerator.....C. G. Schmidt et al  
Refrigerator.....H. J. Shannon  
Refrigerator car condensing coils. Movable  
casing for.....J. L. Morris  
Resistance pile.....E. H. Wise  
Reversing and speed reducing mechanism.....  
.....T. B. Jeffery  
Revolving bin.....E. E. Donaldson  
Roasting or drying apparatus.....W. Harvey  
Rolling machine.....O. Windecker  
Roost. Chicken.....E. Royce  
Rotary engine.....F. A. Franzen  
Rotary engine.....N. H. Molsinger  
Rotary engine.....E. E. Fuller  
Roving guide traverse motion.....L. Owen  
Saddle. Riding.....F. J. Beckerman  
Safe.....J. H. Dodson  
Safe.....H. Jaarsma  
Sand blast machinery.....B. C. Tilghman, Jr  
Sash fastener.....H. Van Wie  
Sash joint. Window.....C. Mundel  
Saw. Band.....W. Maddocks  
Scale registering device. Automatic.....  
.....C. A. Carlson  
Scraper. Wheel.....C. H. Sawyer  
Scraper. Wheeled.....C. H. Sawyer  
Screw threading machine.....G. M. Pfaff  
Seed stripper. Grass H. T. & W. H. McCormick  
Seeder.....G. W. Denyes et al  
Separating machine.....F. H. Schule  
Settling device.....J. F. Gent  
Sewer mold.....J. B. Blaw  
Sewing machine fan attachment F. Holzmark  
Sewing machine feeding mechanism J. Kohler  
Sewing machine looper.....D. L. Anthony  
Sewing machine stitch divider S. J. Wentworth  
Sewing machine work holder.....M. B. Woodruff  
Shade roller bracket.....W. Fieldhouse, Jr  
Shade structure.....W. J. Hayes  
Shade. Window.....P. G. Emery  
Sharpening machine.....A. M. McLeran  
Sheet metal plate handling apparatus.....  
.....O. Clark  
Sheet or tin plate mills. Automatic catcher  
for.....C. W. Bennett  
Shelf bracket. Adjustable tension window.....  
.....J. Oppenheimer  
Shelving. Bracketed.....J. R. Lake  
Shingle. Metallic roofing.....H. E. Moomaw  
Shoe.....H. C. Kenworthy et al  
Shoe polishing cloth grip.....C. L. Darboraw  
Shot for shrapnel. Charging.....A. Haase  
Show case. Revolvable.....C. Gautert  
Sign clamping device. Street.....A. D. Benham  
Signal recorder.....H. W. Doughty et al  
Signal transmission and receipt.....  
.....R. A. Fessenden  
Signal transmitter. Multiple 2 pats G. E. King  
Signaling apparatus.....P. Jacobi  
Signaling by electromagnetic waves.....2 pats..  
.....R. A. Fessenden  
Signaling by electromagnetic waves. Selective  
.....R. A. Fessenden  
Signaling receiver.....R. A. Fessenden  
Skirt and dress waist retaining device.....  
.....A. J. Macqueene  
Skirt and shirt waist holder.....C. L. Stephenson  
Skirt lifter.....R. Lautenbach  
Slag furnace.....R. Baggaley et al  
Sled runner. Detachable spring.....A. White  
Sleigh.....G. Snell  
Smoke consuming apparatus.....G. A. Doebbel  
Smoke consuming furnace.....J. A. McAllister  
Soap handle.....E. J. Howard  
Soda ash dust. Apparatus for retaining.....  
.....C. P. Carlson  
Solder from sheet metal cans. Means for re-  
moving superfluous.....O. S. Fellows  
Sole leveling machine.....H. A. Webster  
Sound record or blank.....W. H. Miller et al  
Sound records or blanks. Making.....  
.....W. H. Miller et al  
Spectacle holder.....A. W. Rogers  
Speed changing mechanism for machine tools  
.....J. Mills  
Speed mechanism. Variable.....H. M. Norris  
Spindle footstep.....T. Ashworth  
Spinning machine drawing apparatus.....  
.....F. Weeeler  
Spinning machine roll cleaner.....  
.....T. O. Cunningham  
Spinning mule.....H. S. Golland et al

Spring reel.....I. V. Edgerton et al  
Sprinkling cart.....C. F. O'Neil  
Stacker deflector.....G. F. Conner  
Stake holder release.....J. Skelton  
Stamp. Hand.....G. Lobitz  
Stamp, stationery, and cash box. Combined..  
.....G. W. Schweer  
Stay blank. Dress.....H. Feder  
Steam boiler.....M. K. Van der Velde  
Steam box.....H. Cramer et al  
Steam engine.....A. C. Schuman  
Steam generating furnace.....J. L. Giroux  
Steam purifying device.....A. L. Covill  
Steam superheater.....M. Marquardt et al  
Steam trap.....R. G. Brooke  
Sterilizing apparatus.....O. H. Hoffman  
Stone saw.....C. K. George et al  
Stop motion mechanism.....L. D. Wade  
Stopping mechanism.....J. T. Meats  
Stove detachable fire box. Cook I. G. Chatfield  
Stove magazine. Heating.....E. Schoup  
Stove mat.....E. L. Allen  
Stove. Vapor.....L. Dahl  
Strainer.....I. Ersha  
Stringed instrument bridge.....S. C. Roberts et al  
Sugar. Converting wood into.....reissue.....  
.....A. Classen  
Suppository and making same. Covered.....  
.....D. Genese  
Surgical absorbent dressing. Sterilizing and  
packaging.....R. W. Johnson  
Surveyor's rod.....W. L. E. Keuffel  
Suspenders.....R. T. Clarke  
Switch.....J. Smith  
Switch and signal operating mechanism.....  
.....C. E. Brown  
Tablet for roll paper. Writing.....J. P. Dorr  
Table guide and fastener.....R. A. Moore, Jr  
Target. Flying.....C. Nelson  
Teaching device. Penmanship.....W. W. Fry  
Telegraph apparatus.....J. C. Barclay  
Telegraph. Printing.....H. Casevitz  
Telephone circuits. Means for preventing the  
disturbance of.....C. J. A. Michalke  
Telephone system. Central energy K. B. Miller  
Telephony.....W. E. Pemberton  
Thermostat.....T. O. Perry  
Threshing machine.....N. E. Heieren  
Tire and fastening therefor. Vehicle.....  
.....R. M. Connable  
Tire fastener.....R. M. Connable  
Tire. Vehicle.....R. W. Brooks  
Tool. Combination.....J. D. McKinnon  
Tool. Combination.....H. K. Harbaugh  
Tool. Combination.....W. E. Haight  
Tool handle wedge.....O. Weston  
Tool. Pneumatic.....C. W. Peck  
Tooth. Artificial.....G. A. Louque  
Trace holder.....R. E. Barnes  
Trace support.....H. Brooks  
Track. Curved momentum gravity C. M. Smith  
Traction engine.....J. K. Kendrick  
Tramway or railway collector. Electric.....  
.....A. Bolzano  
Transformer.....T. J. Johnston  
Tree holder.....T. J. Briuer  
Trees, &c. Metal guard for protecting.....  
.....A. F. R. Arndt  
Trolley.....W. S. Stockton  
Trolley wheel.....2 pats.....F. B. Corey  
Trolley wheel bearing. Self lubricating.....  
.....C. E. Stanley  
Trolley wire finder.....T. S. Herrick et al  
Truck bolster. Railway car.....H. R. Keithley  
Tubes, &c. Machine for glazing.....J. Conde  
Tubular boiler.....J. S. Stevens  
Type casting machine type controlling device  
.....F. Wicks  
Type line justifying machine.....B. F. Bellows  
Type writer.....C. J. Paulson  
Type writer. Cipher.....F. Sedgwick  
Type writer escapement.....J. G. Peterson  
Type writer escapement mechanism.....  
.....W. R. Fox et al  
Type writer table.....F. W. Hillard  
Type writer table. Book 2 pats F. W. Hillard  
Type writing machine.....2 pats C. H. Shepard  
Type writing machine for the blind.....  
.....H. H. Hodgson  
Underwaist.....E. H. Horwood  
Vacuum pan drum.....M. Ekenberg  
Valve.....W. P. Wallis, Jr., et al  
Valve.....F. Strnad  
Valve and operating means.....C. H. Peck  
Valve. Engine.....M. W. Hibbard et al  
Valve. Flush tank.....W. Taylor  
Valve. Flushing.....H. Wehner  
Valve. Gas or other pipe.....E. S. Root et al  
Valve gear for fluid operated motors.....  
.....H. B. Watson et al  
Vapor burner. Incandescent.....L. Denayrouze  
Vegetable blanching machine F. A. Blackmon  
Vehicle brake.....E. Kepp  
Vehicle. Motor.....R. J. Urquhart  
Vehicle. Motor.....T. L. Boyle  
Vehicle top. Folding.....W. T. & E. Y. Temple  
Vehicles. Heating and igniting attachment  
for steam propelled.....C. I. Dangler  
Vehicles on loop tracks. Steering apparatus  
for.....C. M. Smith  
Vehicles. Shaft connecting gear for motor  
road.....F. Charron et al  
Vending apparatus.....R. C. Kelly et al  
Vending machine.....J. M. Jacobs  
Vending machine.....W. J. Rush  
Vending machine.....L. W. Baldwin  
Vessels. Apparatus for relieving grounded..  
.....G. E. Balch  
Vinegar generator.....R. Douglas  
Vise.....E. W. Fulton  
Vise. Bench.....B. L. Williamson  
Wagon brake.....J. Young et al  
Wagon discharging apparatus.....W. P. Gibson  
Wagon. Dumping.....G. W. Roberts  
Wagon running gear.....L. A. Wheeler  
Waist former.....F. S. Boedefeld  
Walls and partitions for buildings, &c. Con-  
struction of.....W. F. Walker  
Washing machine.....F. C. Fette  
Washing machine.....J. G. L. Myers  
Washing machine.....D. S. & L. D. Tyler  
Watch holder.....F. W. Messer  
Water cooling tower.....A. M. Schreuder  
Water heater. Electrical. 2 pats.....H. M. Hill  
Weighing apparatus.....L. E. Cowey  
Weighing apparatus. Automatic.....  
.....K. V. Berglund  
Weighing machine.....H. A. Danne  
Weighing machine. Automatic A. H. Canning  
Well agitator. Oil.....A. B. Gahagan  
Wheel.....A. Russell

Wheelbarrow.....E. F. Hull  
Whiffletree.....T. Lynch  
Window.....P. J. Hasselquist  
Window.....J. Horsfield  
Window screen.....J. Birmelin  
Window screen.....A. M. Scheurle  
Wire machine. Barbed.....H. E. Schnabel  
Wire reeling apparatus.....J. W. Brooks  
Wood working machine.....L. Morin  
Woodworking machine cutter guard.....F. L. Forster  
Woodworking machine guide.....F. L. Forster  
Wrench.....C. H. Spaulding  
Wrench.....W. King  
Writing and adding machine. Combined..  
.....L. Maybaum  
Zinc dust producing apparatus.....2 pats.....  
.....G. G. Convers et al

## DESIGNS.

Dish or similar article. Covered.....  
.....C. J. Ahrenfeldt  
Match scraper.....A. B. Risley  
Musical instrument body. Stringed.....  
.....C. E. Brown  
Range.....G. W. Cope et al  
Range. Cooking.....A. F. Harter  
Spoons or similar articles. Handle for.....  
.....3 pats.....E. Crees et al  
Statuette.....R. F. Outcault  
Stove. Heating.....G. W. Cope et al  
Teapot or similar article.....C. J. Ahrenfeldt  
Tiling.....T. F. Furness

Issued May 12, 1903.

## MECHANICAL PATENTS.

Acetylene generators. Automatic governor for  
.....F. Sedgwick  
Acid in products of combustion. Device for  
automatically recording the amount of carbonic  
.....P. Schultze  
Acid or other liquid distributing system.....  
.....W. L. Colson  
Acid or other liquid distributing system.....  
.....F. M. Wever  
Aerating liquids and bottling same. Machine  
for.....T. Sutcliffe  
Air brake pipes. Fluid pressure coupling for..  
.....J. G. Ludwig  
Air brake system attachment J. W. Alexander  
Air compressor.....J. C. Williams  
Air. Means for filtering, attenuating, and  
moistening or drying.....J. Brady  
Aluminium and its alloys. Producing.....  
.....D. A. Peniakoff  
Annealing box.....M. D. Grimm  
Annealing metal plates.....M. D. Grimm  
Apparel. Articles of.....A. B. Saliger  
Armor for ships' turrets, &c.....  
.....C. P. E. Schneider  
Artist's outfit.....J. Neumann  
Ash receiver and match safe. Combined..  
.....D. P. Moody  
Auger. Post.....J. D. Sanford  
Automatic switch. Intermittent.....H. Wolf, Jr  
Awning.....T. Thoms  
Axle box. Car.....J. Maltby  
Bag holder.....E. E. Jenkins  
Baling press.....W. R. Colman  
Baling press feeding apparatus O. C. Bowman  
Baling press plunger.....G. Schubert  
Ball register. Electric base.....J. M. Humphreys  
Band cutter and feeder.....J. D. N. Reeves  
Basket. Bottle.....J. A. Roudil  
Battery connector. Electrical.....W. R. Edwards  
Bearing. Ball.....M. Reid  
Bed pan.....L. M. Hoffman  
Belt shipper safety lock.....W. G. James  
Belt support. Conveyor.....G. C. Plummer  
Bending machine.....W. H. Johnson  
Bicycle.....J. S. Copeland  
Bicycle attachment.....W. E. Stockton  
Bin.....E. J. Walker  
Binder. Temporary.....P. Buford  
Boat gunwale. Sectional hollow.....J. L. Burton  
Boiler tube or flue scraper and cleaner.....  
.....A. O. Cruzan  
Boiling by electricity. Apparatus for.....  
.....R. C. Sayer  
Bolt or spike puller.....O. Giltner  
Bonnet. Child's.....M. E. Higgins  
Bookcase. Sectional.....W. R. Wolf  
Book mark.....A. G. Bauer  
Boring tool.....G. R. Rich  
Bottle dose indicator. Medicine.....N. S. Lea  
Bottle. Non-refillable.....J. R. Latham  
Bottle. Non-refillable.....J. C. Gustavson  
Bottle. Non-refillable.....M. & B. O'Meara  
Bottle stopper.....F. B. Thatcher  
Bottle stopper head.....L. Strebel  
Bottle washing machine.....E. B. Poggensee  
Bottled goods. Treating.....R. Birkholz  
Box.....W. C. Doscher  
Box lid, supports, &c.....E. C. Luks  
Braiding machine.....J. J. Feeley  
Brake lever.....J. White  
Braking device. Automatic adjustable.....  
.....M. M. Miller  
Branding iron. Self-heating.....W. A. King  
Brick mold.....J. A. Heintz  
Brick molding machine.....W. J. Leary  
Brush. Bath.....T. L. Newport  
Brush holder.....A. F. Batchelder  
Brush soap feeding attachment.....J. C. Gabel, Jr  
Brush. Tooth.....C. A. Torrance et al  
Bubble blower.....P. D. Horton  
Buckle.....D. M. McLean  
Building construction.....G. Y. Bonus  
Burglar trap.....W. Lawrence  
Butter, lard, &c. Cutting device for.....  
.....B. Hamblet  
Button.....F. H. Larter  
Button. Collar.....J. M. Kane  
Cabinet.....M. R. Maher  
Cabinet. Revolving.....G. W. Chaffin  
Cable terminal.....J. J. O'Connell  
Camera multiplying attachment. Photographic  
.....W. D. Himes  
Can forming and seaming machine.....  
.....C. Puddefoot  
Can opener.....N. Cleveland  
Candy pulling or aerating machine.....  
.....M. E. Berrye et al  
Car.....E. W. Summers  
Car. Box or produce.....J. M. Hansen  
Car. Combination steel.....W. Rohrbacher  
Car coupling.....E. C. Washburn

Car coupling.....2 pats.....C. A. Tower  
Car door operating device. Hopper.....  
.....A. Christianson  
Car. Express or mail protection.....  
.....G. V. Booco et al  
Car fender.....A. L. Igou  
Car frame. Motor.....A. Poidatz  
Car. Gondola.....J. M. Hansen  
Car. Hopper.....J. M. Hansen  
Car. Low side gondola.....J. M. Hansen  
Car. Railway.....W. K. Auchincloss  
Car. Railway.....L. A. Shepard  
Car. Railway.....C. Vanderbilt  
Car step. Folding.....G. E. Cunningham  
Car step. Folding.....N. Gray  
Car. Stock.....J. M. Hansen  
Car with flush doors. Hopper.....J. M. Hansen  
Car with truss rods.....J. M. Hansen  
Carbonating or other apparatus. Means for  
separating air from liquid in.....G. L. Bastian  
Carbureter. Gas engine.....T. B. Jeffery  
Carbureter. Gasoline engine.....G. Kingston  
Carom gun.....L. E. Eickelberg  
Carriage door and window.....2 pats.....  
.....J. B. Le Maitre  
Cast off.....R. F. Bartel  
Cattle guard.....D. W. Emerson et al  
Ceiling or wall box.....J. T. Robb  
Chain. Fob.....S. O. Bigney  
Chair.....J. R. Brott  
Chairs, &c. Locking device for.....  
.....T. W. Washburn  
Cheese cutter.....W. G. Templeton  
Chlorates and perchlorates. Electrolytic manu-  
facture of.....P. Lederlin  
Chuck and boring tool.....J. J. Kearney  
Chute.....W. J. Patterson  
Circuit closer. Periodic.....C. D. Haskins  
Circuit controller. Time limit.....C. D. Haskins  
Clamp.....R. H. Makowsky  
Classifier.....W. Hoffman  
Clutch. Electromagnetic.....E. V. Beals  
Clutch. Magnetic.....E. G. Knowlton  
Clutch. Magnetic.....H. G. Reist  
Cock or valve. Oil.....H. E. Brunner et al  
Collar head.....2 pats.....reissue C. L. Hildreth  
Coke drawing machine.....5 pats.....  
.....J. A. Hebb  
Coke drawing machine conveying mechanism  
.....J. A. Hebb  
Collar. Split.....H. W. Stauffer et al  
Column clamp.....A. A. Loetscher  
Column lock joint.....W. L. Taylor  
Compressed air elevator for fluids.....J. W. Sloan  
Conveyer.....H. M. Crites  
Conveyer or elevator. Endless.....J. L. Giles  
Corn husker.....L. A. Aspinwall  
Corn husking implement.....F. D. Kees  
Corn husking machine.....W. Schultz  
Cornice break cutting attachment.....G. R. Hyde  
Cornice mold. Self-mitering.....M. D. Lewis  
Countersink.....G. W. Brackin  
Coupling centering device.....E. F. Chaffee  
Coupling centering device.....H. H. Forsyth  
Coupling centering device.....H. H. Forsyth  
Crane.....L. S. Fleckenstein  
Cream separator.....H. Galer  
Creaming machine. Sputa.....O. J. Jordan  
Cross head slippers. Adjusting means for.....  
.....F. H. Blanding  
Culinary utensil.....W. G. Browne  
Curling iron heater.....M. M. Buck et al  
Curtain fixture.....J. Lewandowski  
Curtain pole hanger.....C. L. Sharp et al  
Damper. Automatic.....T. W. King  
Dental drill obtunding attachment.....  
.....C. R. Basford  
Dental swaging machine.....C. F. Lauderdale  
Derrick. Combination.....J. B. Martin  
Display front for drawers, &c. A. A. Middleton  
Display rack.....A. S. & W. H. Strickler  
Door. Sliding.....P. H. Puschel  
Double headed bolt and lock.....J. W. Dixon et al  
Dough raiser.....G. Weiler  
Draft equalizer.....W. H. Shell  
Draft equalizer.....W. M. James  
Dredge cutter head.....A. W. Robison  
Dredge. Gravel or sand.....R. Hosford  
Drying roll or cylinder.....G. Murgatroyd  
Duplicating or stencil machine.....J. Juricic  
Dye and making same. Black azo A. Schmidt  
Dye. Azo.....3 pats.....M. Kahn  
Dye. Black azo.....M. Kahn  
Dye. Monoazo.....2 pats.....M. Kahn  
Dyeing machine. Skein.....W. H. Fletcher  
Easel. Album.....J. Berbecker  
Egg testing device.....G. A. White  
Electric circuit ground detector.....T. W. Varley  
Electric circuits. Apparatus for maintaining  
uniform resistance in.....F. A. Gilbert et al  
Electric current regulator.....T. Spencer  
Electric machine. Dynamo.....V. G. Apple  
Electric machines. Antihunting device for dy-  
namo.....H. F. T. Erben  
Electric machines. Cooling dynamo.....  
.....E. D. Priest  
Electric machines. Means for cooling dynamo  
.....E. D. Priest  
Electric meter.....E. J. King  
Electric motor.....B. A. Stowe  
Electric motor. Alternating current.....  
.....B. A. Stowe  
Electric motor system.....W. B. Potter  
Electric switch.....V. G. Apple  
Electric time switch.....W. C. Blundell et al  
Electric time switch.....M. A. Nickerson  
Electrical coils. Winding.....R. Varley  
Electrical contacts. Means for accentuating..  
.....E. Thomson  
Electrical protective device.....E. B. Ellicott  
Electrolytic apparatus.....F. J. Briggs  
Elevator.....J. T. Ham  
Elevator or storage bin construction.....  
.....B. H. Stahl  
Engine.....E. H. Amet  
Engine.....G. Colombo  
Engine regulator. Gas.....V. G. Apple  
Engine starter. Gas.....R. A. Mitchell et al  
Engines. Controlling mechanism for internal  
combustion.....C. O. Hedstrom  
Engraving processes. Screen or grating for  
half-tone photomechanical.....H. Lyon  
Excavator.....W. E. & P. J. Maloney  
Explosion engine.....L. M. Foster  
Eyeglasses.....G. H. Chapel  
Eye testing devices. Cabinet for exhibiting..  
.....J. M. Johnston  
Farm gate.....D. Mathies  
Feed box for horses or cattle. Automatic.....  
.....E. J. Faulkner



Fence stretcher. Wire..... I. M. Warner  
Fifth wheel..... F. B. Whitlock  
Filing case..... J. F. Beckbissinger  
Filter. Oil..... G. D. Taylor et al  
Finger rings, &c. Interchangeable initial  
letter or insignia for..... J. A. Lieb, Jr  
Fire door..... C. E. Simpson  
Fire escape..... H. R. Cole  
Fire escape..... T. Kelly  
Fire escape..... J. Triplett  
Fire escape. Portable..... J. B. Lloyd  
Fire kindler. Automatic..... 2 pats.  
..... M. G. Hoffman et al  
Flesh rubber..... O. R. Burkart  
Flower bed..... J. L. Dillon  
Flue cleaner..... F. Olson  
Flue scraper..... F. Olson  
Flux..... H. R. Brocius et al  
Folding box..... 2 pats..... Z. B. Webb  
Food product and preparing same..... F. Bunyan  
Fuel. Artificial..... C. F. Russi et al  
Fuel. Artificial F. C. von Heydebrand und der  
Lasa  
Furnace..... F. G. Cooper  
Furnace charging apparatus. Blast.....  
..... J. C. Cromwell et al  
Furnace charging apparatus. Blast.....  
..... J. C. Cromwell  
Furnace reversing valve. Regenerative.....  
..... J. A. Herrick  
Furnaces. Means for utilizing liquid fuel in.....  
..... J. Berg  
Furniture. Sectional..... F. Macey  
Fuse for artillery projectiles. Time C. Baker  
Galvanometer..... A. Blondel  
Garment fastening..... F. C. Evans  
Garment hook..... H. Kerngood  
Garment supporter..... H. C. Hine  
Gas burner..... W. C. Clarke  
Gas burner..... C. M. Armstrong  
Gas fixture..... S. Joseph  
Gas produced by fermentation in breweries.  
Collection and utilization of carbonic acid.....  
..... O. Zwietsch  
Gas regulator..... G. S. Bennett  
Gas storage apparatus..... E. Fouché  
Gate..... J. W. Brown  
Gate..... J. M. Barley  
Gear cutting machine..... H. E. Eberhardt  
Gear cutting machine H. E. & F. L. Eberhardt  
Gear. Speed changing..... P. H. White  
Gin feeder and separator..... J. W. Seifert  
Glass. Cameo..... A. H. Freeman  
Golf club..... G. W. Mattern  
Governor..... N. Lombard  
Governor for gas engines. Electric V. G. Apple  
Grader. Elevating..... T. R. McKnight  
Grading and ditching machine. Road.....  
..... R. Russell  
Grading machine..... B. F. Edes  
Grain drill disk attachment..... C. A. Hardy  
Graphophone reproducer..... F. L. Capps  
Grave covering..... B. A. Buchanan  
Greenhouse valley gutter..... J. L. Dillon  
Grinding knife blades. Machine for auto-  
matically..... A. Gonon  
Grinding machine..... W. F. Lomasney  
Guns. Constructing and assembling.....  
..... A. H. Emery  
Guns. Constructing and assembling parts of.....  
..... A. H. Emery  
Hame..... J. E. Keeverline  
Hammer. Pneumatic..... F. M. Iler  
Handle for valises, parcels, teapots, &c.....  
..... B. Weber  
Harness clip..... J. Reichert  
Harness pad..... W. Smith  
Hay carrier..... 2 pats..... P. A. Myers  
Hay press..... J. T. Wright  
Hay tedder attachment..... P. V. Blue  
Heel. Boot or shoe..... C. Campbell  
Hides or skins. Treating..... A. H. Peter  
Hinge..... G. A. Long  
Hinge for railway coach vestibules. Trap door  
..... G. H. Griffin  
Hinge. Spring..... H. B. Sargent  
Hoisting, conveying, or excavating machine.....  
..... F. E. Potter  
Hollow bodies. Apparatus for forming ser-  
pentine..... K. Park  
Hook and eye..... N. R. & J. M. Persinger  
Horn and rattle. Campaign..... C. T. Childers  
Horseshoe..... J. C. & J. I. Piper  
Hose or pipe coupling..... H. A. Stier  
House ventilator..... G. B. Swope  
Hydrocarbon furnace..... J. Greer  
Ice scraper..... F. B. Corey  
Igniting composition and making same.....  
..... O. Dieffenbach et al  
Igniting system..... V. G. Apple  
Induction motor for variable speeds.....  
..... A. Meuschel  
Ink well holder..... J. C. Killey  
Insulating joint..... J. T. Robb  
Insulating means for electrical apparatus.....  
..... A. F. Batchelder  
Iron. Means for handling puddled.....  
..... M. McDowell  
Ironing board..... H. H. Lang  
Jar..... J. A. Maxson  
Jar closure..... D. Knowlton  
Journal bearing..... J. F. Harrigan  
Kneading and mixing machine..... E. W. Osburn  
Knockdown adjustable chair.....  
..... D. M. Stewart et al  
Lace hook. Shoe..... M. V. Kelly  
Lamp burner..... G. A. Hall  
Lamp burner and font..... G. T. Brown  
Lamp. Electric arc..... A. G. Davis  
Lamp. Electric..... E. W. Rice, Jr  
Lamp. Electric arc..... E. Thomson  
Lamp globe and chimney. Combined.....  
..... J. M. Stokoe  
Lamp. Shunt wound series arc..... M. H. Baker  
Lamp socket..... W. H. Cole  
Lamp. Switchboard incandescent.....  
..... A. D. Whipple  
Lantern..... G. T. Brown  
Lantern. Tubular..... G. T. Brown  
Latch. Gate..... J. F. Bittle  
Latch. Gate..... P. Deardorff  
Lathe gearing. Turret..... C. E. Search et al  
Leach picher..... J. R. Morrison  
Leather board making machine..... E. D. Alvord  
Leather splitting machine spring roll.....  
..... W. D. Quigley et al  
Lighting arrester..... 2 pats..... H. E. Raymond  
Limekiln economizer..... T. Ryan  
Link block..... J. E. Arthur et al  
Linotype machine..... P. T. Dodge  
Liquid fuel burner..... C. W. Spicer  
Lock..... C. J. Roach

Log loading machine..... M. Schmaltz  
Loom heddle..... J. Walker  
Loom shuttle motion..... O. Bullock et al  
Loom. Swivel..... J. Wadsworth  
Loom warp and weft stopping mechanism.....  
..... W. H. Baker et al  
Loom warp let-off mechanism..... J. M. Peckham  
Lubricator..... L. Waters  
Mail collection device. Railway.....  
..... C. A. Pfanstiehl et al  
Mail crane..... T. J. Conway  
Mailing tube..... T. H. Grace  
Mantel..... J. E. Holbein  
Massage cup..... C. Pfanschmidt  
Mast hoop..... 3 pats..... R. W. Vail  
Match box..... C. R. Reeve  
Match holder and igniter. Self feeding.....  
..... C. H. Scales  
Match safe..... J. W. Selander  
Meat roast support..... J. V. Young  
Merry-go-round..... P. Friedman  
Metal wheel. Cast..... J. McCallum  
Metal working tool..... A. B. Hill  
Metals. Extracting noble..... F. W. Martino  
Metallurgical or chemical vessels. Appliance  
for use with..... W. Lyues  
Meter..... W. C. Fish  
Mileage holding and counting device.....  
..... E. R. Allen  
Mining machine..... W. A. L. Robertson  
Mirror. Transparent..... R. Wilson  
Miter box..... W. B. May  
Moistener. Finger..... R. C. Glanville  
Molding and casting flask..... J. C. Reed  
Molding machine..... B. B. Carter et al  
Mop head..... A. S. Held  
Mop. Fountain..... J. Thompson  
Mop wringer..... J. M. Baker  
Mowing machine..... J. W. Latimer  
Mowing or other agricultural machine lifting  
guard..... F. Blocki  
Muffler..... F. E. Hipple et al  
Music leaf turner..... W. T. Paxson  
Musical instrument..... O. H. Moen  
Musical instrument. Automatic..... C. Coleman  
Musical instrument automatic playing attach-  
ment..... P. Welin  
Musical instrument. Wind..... G. B. Mackey  
Musical instruments. Sound muffler for auto-  
matic..... M. Clark  
Needle grinding machine..... E. D. Gleason  
Nozzle. Dilating..... G. Otto  
Nut. Axle..... W. C. De Mareno  
Nut lock..... J. B. Uren  
Nut lock..... F. M. Smith  
Oar. Bow facing..... E. S. Anderson  
Oil can..... M. Masterson  
Oil can cleaning attachment..... F. W. Skinner  
Oil meal into soft cakes. Repressing.....  
..... W. P. Callahan et al  
Oil press box..... W. P. & W. C. Callahan et al  
Oil tank. Hydraulic..... A. C. Frieseke  
Oliver..... J. H. Thomas  
Ordnance. Constructing and assembling the  
parts of heavy..... A. H. Emery  
Ore classifier..... J. Klein  
Ore classifier. Rotary..... J. Klein  
Ore crusher..... J. A. Johnson  
Ore separating and concentrating apparatus.....  
..... F. E. Parker  
Ores. Chlorinating and brominating.....  
..... J. D. Hawkins et al  
Oxidizing furnace. Metal..... J. W. H. James  
Packing..... O. T. Raymond  
Packing. Pipe joint..... E. G. Wright  
Packing. Rod..... T. W. Mitchell  
Pad moistener and letter copying press. Com-  
bined..... W. N. Phillimore  
Padlock..... F. Soley  
Pail handle. Detachable..... A. R. Ayson  
Paper box machine..... C. C. Davis et al  
Paper holder. Roll..... L. T. Arnold  
Parcel carrier..... J. B. Phillips  
Paste jar..... C. B. Gordon  
Pasting device..... C. E. Dulin  
Peanut or coffee roasting and warming de-  
vice..... C. North  
Permanganates. Production of..... W. Hickmann  
Phosphate distributor..... E. W. Johnson  
Photographic printing apparatus.....  
..... H. H. McIntire  
Piano pedal locking attachment..... A. J. Newby  
Picker stick bunter..... G. Swift  
Picture apparatus. Moving..... G. M. Higgins  
Pie rolling machine..... H. H. Jones  
Piling and means for sinking same. Sectional  
sheet..... H. A. Miller  
Piling. Composite..... A. E. Brown  
Pipe crimping machines. Shaping wheel for  
sheet metal..... A. G. Scherer  
Pipe former. Sheet metal..... S. M. Schmeltzer  
Piston..... C. L. Haase, Jr  
Placket closure..... M. L. Perrotet  
Planter. Cotton or pea..... P. J. Smith  
Plants from streams. Apparatus for removing.....  
..... A. King  
Plow. Double..... R. V. E. Rasmussen  
Plow plant protector attachment..... I. W. Bass  
Plug machine..... W. R. Montgomery  
Pneumatic brake. Double acting.....  
..... A. A. Fickenschner  
Pneumatic spring..... B. L. Sanders  
Pocket knife..... J. Weil  
Post office cabinet..... H. G. Wagner  
Precipitating apparatus..... P. W. McCaffrey  
Printer's galley..... E. Hall  
Printer's galley..... W. A. Faucett  
Projectile..... M. C. Regan  
Protractor, triangle, and curve. Combined.....  
..... F. W. Otis  
Pruning saw. Pneumatic..... W. Young  
Pruning shears. Pneumatic..... W. Young  
Pulley..... R. W. Dull  
Pulp screen. Centrifugal..... J. H. Baker et al  
Pump motor..... J. A. Workman, Sr  
Pump. Rotary..... W. E. Cook  
Push button. Electric..... J. Y. Parke  
Puzzle..... N. D. Ingram et al  
Radiator. Air heating..... J. A. McDaniel  
Radiator support..... H. D. Kellogg  
Railway carriage coupling. Automatic.....  
..... J. Willison  
Railway carriage. Ship..... B. Kirsch, et al  
Railway guard rail support..... O. Paulhus  
Railway rail joint..... T. Higgins  
Railway rail joint base plate..... R. B. Charlton  
Railway signal..... A. W. Olund  
Railway signal controlling system. Electric.....  
..... G. Gibbs  
Railway track rails. Method of and apparatus  
for making continuous lengths of.....  
..... C. E. Mark

Railway tie..... J. T. Shaw  
Railway tie. Metallic..... C. S. Seitz  
Recreation device..... J. Wilson  
Refrigerator..... J. Rossi  
Register..... J. L. Giles  
Rivet cutter..... E. F. Galloway, Jr  
Roadways, sidewalks, &c. Construction of.....  
..... G. D. Wausbrough  
Rollers with india-rubber, &c. Machine for  
covering..... R. Milne  
Rope clamp..... J. S. Hermanson  
Rotary engine..... H. C. Essington  
Rotary engine..... N. S. Taylor  
Rotary engine..... E. Blucker  
Rotary engine..... A. Box  
Rotary steam engine..... S. Olson  
Rule gage..... E. A. Bircher  
Rule. Measuring..... W. E. Severance  
Sand box and mechanism for actuating same.....  
..... J. W. Endean  
Sash fastener..... C. H. Hook  
Sash fastener..... F. Keilwerth  
Sash holding device..... G. F. Lyman  
Sash lock..... J. MacVane  
Sashes. Automatically operating window.....  
..... R. Rupp  
Scale and chord indicator..... E. L. Sanford  
Scale. Weighing..... J. H. Swihart et al  
Scraper or self-loading cart. Wheeled.....  
..... C. H. Sawyer  
Screen or storm window attachment.....  
..... R. Ellingson  
Screw anchor..... T. Tribe  
Seal press. Ratchet..... E. J. Brooks  
Sealing and stamping machine. Letter.....  
..... J. N. Stacy  
Sealing apparatus. Jar..... W. H. Honiss  
Sealing means. Vessel..... J. M. Hicks  
Seaming machine. Automatic double.....  
..... J. G. Hodgson  
Sectional boiler..... L. R. Libby  
Shade cloth trimmer..... F. McDaniels  
Shade roller bracket..... B. F. Johnson  
Shaft connection. Adjustable..... G. P. Clark  
Ships at sea. System of coaling..... A. K. Finlay  
Shirt sleeve shortener and cuff fastener.....  
..... S. O. Grave  
Show case..... W. Bower  
Shuttle. Self threading..... S. B. Cutting  
Sickle bar clip. Ball bearing..... I. Trimble  
Signaling or calling system. Electrical.....  
..... 3 pats..... C. B. Smith  
Sink strainer..... E. E. Weed  
Siphon..... 2 pats..... S. W. Miller  
Slaughtering apparatus..... J. H. Cook  
Sleigh runner attachment. Vehicle..... E. Kaiser  
Sliding gate..... A. Mason  
Smoke in furnaces. Preventing.....  
..... J. Wilson et al  
Socket cover and shade holder. Combined.....  
..... E. Gothberg  
Sound recorder. Automatic.....  
..... V. H. Emerson et al  
Sound recording tablet..... J. W. Jones  
Speed changing box..... R. K. Le Blond et al  
Spinning frame bolster rail..... D. A. Tompkins  
Spinning spindle..... M. E. Sullivan  
Stairway. Traveling..... I. H. Venn  
Stamp. Chronometric..... F. A. E. Burda  
Stamp mill..... C. C. Lane  
Steam engine..... O. Crompton  
Steam generator. Vertical..... E. Establie  
Stitching machines. Machine for feeding pam-  
phlets, &c., to..... J. C. Rodgers  
Stoker. Mechanical..... P. J. Harleman  
Stove. Hot blast..... J. Kennedy  
Stove or range..... B. F. Allen  
Stoves, ranges, &c. Composition for destroy-  
ing and removing carbon or soot from.....  
..... A. R. Radtke  
Striking bag..... R. Reach  
Submarine construction..... L. L. Rinaldi  
Suspender belt coupling..... M. Goldin et al  
Suspenders..... H. C. Hine  
Suspenders..... H. L. A. Seidel  
Swage block..... H. B. Blood  
Switchboard and circuits. Electric.....  
..... V. G. Apple  
Switchboard. Electrical..... E. B. Ellicott  
Synchronizing apparatus for alternators.....  
..... F. T. Dow  
Syringe. Hypodermic..... T. A. Chappell  
Tablets, &c. Apparatus for forming.....  
..... E. Dünring  
Tank..... R. G. Stone  
Tanning extracts. Making..... M. Honig  
Telephone..... M. R. Hutchison  
Telephone..... W. L. Denio  
Telephone and fire alarm system. Combined.....  
..... W. L. Denio  
Telephone call annunciator..... G. K. Jackson  
Telephona line signaling apparatus.....  
..... F. E. Green  
Telephone or other cables. Device for reinsulat-  
ing electric and aerial..... J. Darggett  
Telephone selecting device..... W. D. Watkins  
Telephone special directory..... L. M. Bannan  
Telephone system..... C. B. Smith  
Telescope..... G. Forbes  
Temperatures, the liquefaction of gases, and  
the separation of the constituents of gaseous  
mixtures. Apparatus for producing low.....  
..... 2 pats..... C. Linde  
Thill coupling..... G. S. Engler  
Thread cutter..... H. A. Wehner et al  
Timber. Preservation of..... R. Kroll  
Tire..... G. H. Rafovich  
Tire fastening..... J. F. Byers  
Tire for vehicles. Rubber cushion.....  
..... A. H. Brintnell  
Tire joint fastening device. Pneumatic.....  
..... E. Perceval  
Tire. Resilient..... A. W. Hockman  
Tire. Rubber..... R. Austin  
Tobacco pipe..... M. F. Hahn  
Torch for destroying insects..... S. M. Hess  
Trace. Harness..... J. Ziegler  
Trolley contact device..... C. L. Fitch  
Trolley catcher..... E. Limange  
Truck..... J. M. Hansen  
Truck bolster..... L. A. Shepard  
Truck. Car..... E. W. Summers  
Truck. Radial car..... 2 pats..... R. L. Ellery  
Tube bending machine..... J. E. O'Donnell  
Tube compressing machine..... R. Kuhn  
Tuning pin..... A. J. Clevenger et al  
Tunnel construction..... D. L. Hough  
Turbine..... A. Schenck  
Turbine. Elastic fluid..... C. G. Curtis  
Turbine regulating device. Steam..... Stumpf  
Turbine. Steam..... F. D. Shepherd  
Type writer attachment..... G. A. Danielson

Twyers. Cap and peep hole for blast furnace.....  
..... G. R. Johnson  
Type writer inking appliance..... S. W. Turner  
Type writer table and cabinet..... M. S. Eylar  
Type writing machine..... C. F. Hopkins  
Type writing machine key action..... R. J. Fisher  
Type writing machine tabulating mechanism.....  
..... C. A. Joerissen  
Umbrella..... J. H. Sprague  
Vacuumizing and double seaming machine.....  
..... E. Norton et al  
Valve. Gas engine rotary..... S. H. Dyer  
Valve mechanism..... J. T. Fenton  
Vehicle controlling mechanism. Motor.....  
..... F. O. Farwell  
Vehicle draft attachment..... C. J. Bolte  
Vehicle. Motor..... B. V. Covert  
Vehicle storm shield..... I. O. Denman  
Vehicle storm shield attachment..... J. J. Russell  
Vessel. Marine..... J. McMillan  
Vessel or diving apparatus. Submarine.....  
..... R. Sinclair  
Vise..... C. W. Orvis  
Voting booth..... T. E. Barrow et al  
Voting machine..... W. A. Swaren  
Vulcanizing apparatus rack or holder.....  
..... W. R. Smith  
Wagon box and end gate..... W. Ellis  
Wagon brake. Automatic..... W. H. Beard  
Wagon. Delivery..... J. V. Macdonald  
Wagon wheel..... J. McCallum  
Waip stop motion..... F. A. Whitmore  
Washer manufacturing machine..... G. Fraser  
Watch. Stem winding and setting.....  
..... W. W. Dudley  
Watchmaker's cabinet..... P. C. Hall  
Water level indicator..... J. Dewrance  
Watering device. Automatic..... J. M. Day  
Watering tank. Stock F. E. & C. E. Richards  
Weeder..... F. J. Kelly  
Welding. Electric..... J. Schurek et al  
Welding machine. Automatic electric chain.....  
..... C. A. Leuenberger  
Well drilling tool wire rope socket.....  
..... E. Double et al  
Wheel and rail brake. Combination.....  
..... J. Redmond  
Wheel chair and hammock. Combined.....  
..... L. C. Bullock, Jr  
Windmill..... G. B. Edgar  
Winding spindles. Stop motion for twine.....  
..... B. B. Bowers  
Window..... C. Bickel  
Window dust and air guard..... J. T. Guleser  
Window screen..... E. L. Lloyd  
Wire rope making machine..... S. W. Coriasco  
Wire to other objects. Rigidly securing.....  
..... E. P. Lehmann  
Wood impregnating apparatus..... J. L. Ferrell  
Wrapping machine..... J. H. Felmlee  
Wrench..... W. H. Preston  
Writing apparatus. Cipher..... G. W. Dudley  
Yoke. Animal..... W. M. Landers  
Yoke. Neck..... R. W. Sparks

## DESIGNS.

Advertising clock case..... R. S. Wiesenfeld  
Badge or similar article..... H. F. Blogg  
Box cover..... H. L. Croll  
Chandelier..... 2 pats..... G. H. Ullman  
Divan frame..... D. Pepper  
Fabric. Textile..... C. Sackman  
Inkstand..... D. C. Cahalane  
Lamp. Illuminating..... W. De Freitas  
Range..... G. W. Cope et al  
Spoons or similar articles. Handle for.....  
..... 2 pats..... E. Crees et al  
Stove. Cooking..... 2 pats..... A. F. Harter  
Stove. Heating..... A. F. Harter  
Stove ornament..... F. E. Lee

Issued May 19, 1903.

## MECHANICAL PATENTS.

Adding machine..... A. D. Gilpin  
Advertising apparatus..... W. C. Day  
Agricultural implement..... W. W. Brady  
Air in factories, workrooms, &c. Moistening,  
cooling, or heating the..... L. Sconchetti  
Air or other gases. Mechanism for compress-  
ing..... W. H. Reynolds  
Air separator..... 2 pats..... C. H. Lane  
Albumose. Making..... D. Finkler  
Alkaline sulfates. Making dry..... S. Trivick  
Anchor. Guy..... L. D. Pitcher  
Anchor. Sea..... J. & J. R. Temperley et al  
Arc light. Electrolytic..... W. T. Dean  
Arc light system. Regulator for alternating  
series..... J. H. Hallberg  
Artist's holding and separating clamp.....  
..... G. C. Everett  
Atomizer..... C. A. Tatum  
Axle box. Vehicle..... J. McFarland  
Axle. Revolving..... Wm. F. Bangs  
Baling press..... H. D. Reese et al  
Baling press indicator..... P. & L. Trabue  
Baling press tension band..... P. & L. Trabue  
Ball..... H. M. Singer  
Ball and socket knuckle..... S. A. Schellenger  
Bandage. Chest..... J. Baldwin  
Battery plates. Making..... J. Bijur  
Bearing. Laterally adjustable side.....  
..... G. W. Greenwood  
Bed..... T. L. Mahoney  
Bed bottom..... A. E. Reall  
Bedclothes holder..... S. A. Coffman  
Belt and drawers supporter..... C. Winkler  
Belt supporter..... G. T. Rhoads  
Blast furnace..... O. S. Garrettson  
Blower. Powder..... H. E. Krupke  
Bluing. Spool..... A. K. Phillips  
Boiler cleaning compound..... J. D. & H. P. Scott  
Bolster..... T. Mitchell  
Bonbons, &c. Packing for..... H. Finne, Jr  
Book holder. Order..... C. S. Binner  
Bookkeeping register..... E. Schumacher  
Boot or shoe..... L. A. Daniels  
Boot or shoe holder..... A. H. Baker  
Bottle attachment..... W. J. Lowenstein  
Bottle. Non-refillable..... C. W. Jones et al  
Bottle. Non reusable..... C. H. Spinney, 2d  
Bottle stopper rubber disk attachment.....  
..... T. H. Alcorn et al  
Bottle washing machine..... A. B. Park  
Bottling and corking machine..... F. O. Jerram  
Box cover. Sectional..... T. H. Brady  
Boxes or other receptacles. Corner stay for.....  
..... G. W. Dyarman



Bracket or belt. Automatically adjustable.... F. Mason  
 Brake mechanism. Fluid... J. F. Mallinckrodt  
 Branding apparatus.... A. Hayes  
 Brewers' hose. Machine for cleaning... E. Pehl  
 Briquet.... A. W. Chase  
 Bromin. Recovering.... C. D. Grove  
 Brush and mop and wringer therefor. Combined scrub.... R. H. Thomas  
 Brush holder.... H. Geisenhoner  
 Brush holder.... E. W. Mix  
 Brush holder.... H. Geisenhoner  
 Brush holder. Equalizing.... E. J. Murphy  
 Buckle.... W. F. Crafts  
 Buckle. Belt.... B. Wilentshik  
 Buffer.... J. H. Lovely et al  
 Building. Semipermanent portable.... J. Kulhanek  
 Bundle carrier.... E. A. Peck  
 Bunsen burner.... A. B. Redell  
 Burnishing machine.... J. G. Schneider  
 Cage and cable releasing device.... R. LeRoy  
 Cake cooler.... A. T. Mayo  
 Camera.... W. K. L. Dickson  
 Candle extinguisher.... R. V. Todenwarth  
 Car adjustable housing.... J. A. de Macedo  
 Car brake safety attachment.... L. S. Barber  
 Car construction.... G. I. King  
 Car door bearing.... C. Beatty  
 Car door. Grain.... J. W. Church et al  
 Car draft rigging. Railway.... E. W. Hartough  
 Car dump.... F. S. Ingoldsbey  
 Car. Dumping.... J. D. C. Twigg  
 Car bolster. Railway.... E. Lombard et al  
 Car gate opener. Railway.... F. Weimar  
 Car loader.... E. H. Reynolds  
 Car mover.... A. J. Maine  
 Car. Railway.... S. T. Wellman et al  
 Car replacer.... J. D. Care et al  
 Car roping iron. Railway.... U. S. Drayer  
 Car seat.... L. Janson  
 Car side bearing.... H. M. Perry  
 Car tandem spring draft rigging. Railway.... C. F. Street  
 Car wheels. Apparatus for hardening treads of.... T. Mitchell  
 Car wheels. Hardening tread of cast steel.... T. Mitchell  
 Cars. Automatic life guard or fender for tram.... W. T. Watson  
 Cars. Automatic wheel guard for tram.... W. T. Watson  
 Carburetor.... J. T. Wood  
 Carburetor muffler or silencer.... I. E. Butler  
 Carburetor retort.... J. T. Wood  
 Carpet fastener.... J. R. Russell  
 Carrier.... J. H. McGehee et al  
 Casting with hardened portions and making same. Steel.... H. W. Falk  
 Catamenial napkin.... T. C. Asplund  
 Centrifugal machine.... J. W. Macfarlane  
 Checks. Record attachment for waiters' or merchandise.... A. Wyse  
 Chromium compound and alkalies. Production of.... H. Speckter  
 Chuck. Drill.... K. O. Muehlberg  
 Chuck. Fluid pressure operated.... 2 pats.  
 Churn.... B. M. W. Hanson  
 Cigar tip cutter.... L. C. Martin  
 Circuit breaker.... S. Y. Tabb  
 Circuit breaker or switch for high potentials.... R. H. Read  
 Circuit making and breaking device.... E. M. Hewlett  
 Classifier. Hydraulic.... A. J. Wurts  
 Closet ventilation.... C. W. Merrill  
 Clothes line.... J. J. Donovan  
 Clothes line.... A. L. Richard  
 Clutch.... W. F. Jaenecke  
 Clutch. Friction.... G. W. Ruth  
 Clutch operating mechanism.... E. Turney  
 Coaster brake. Back pedaling.... J. Redding  
 Coat.... J. G. Weimer  
 Cock operating mechanism. Drain.... H. W. McCombs  
 Cock repair spindle.... E. J. Gallagher  
 Cock. Water gage.... J. C. Jensen  
 Coffin dam and caisson. Combined W. T. Pool  
 Coke conveyer. Hot.... M. Graham  
 Collapsible box.... L. A. McCord  
 Collapsible box or crate.... C. Richter  
 Colter and plow.... H. J. Hughes  
 Combers, &c. Cam race pin for cotton.... A. C. Arey, Jr  
 Concentrating apparatus.... A. Ten Winkel  
 Condenser.... C. F. Splittorf  
 Contact breaker.... C. F. Splittorf  
 Controller handle lock.... J. B. Linn  
 Conveyor.... M. C. Schwab  
 Conveyor for separators, &c. Cross S. B. Hart  
 Corborundum and alumina. Treating kaolin for production of.... F. C. Weber  
 Cover of rhombic or leus shaped section. Instrument.... W. Sabel  
 Cork puller.... 4 pats. H. Tscherning  
 Cork puller.... R. H. Wiles  
 Cork puller.... C. Morgau  
 Corn popping apparatus.... C. Cretors  
 Corn husking device.... P. A. Waller  
 Corn sheller.... A. H. & H. A. Berns  
 Corset husks. Means for securing.... R. Scales  
 Counter.... W. L. Sandage  
 Cover. Receptacle.... F. O. Soderstrom  
 Cream. Overhead traveling.... H. A. Otto  
 Cream cooler and aerator.... F. O. Hague  
 Crossbow.... H. Schramm  
 Cuff holder.... W. T. Robinson  
 Cultivator cotton chopping attachment.... C. W. McMillan  
 Cultivator. Two row disk.... A. Holtz  
 Curb and gutter. Combined.... W. H. Ferguson  
 Curler. Hair.... J. D. Smith  
 Current collector.... E. D. Priest  
 Current machines. Starting alternating.... J. E. Woodbridge  
 Curtain attachment. Window.... O. A. Essig  
 Curtain fixture.... B. Kuchborth  
 Cut off water conductor.... S. D. Noel  
 Cycle crank dead point position. Device for overcoming.... E. Johow  
 Dental cuspidor.... H. E. Weber  
 Dental manikin.... E. P. Wright  
 Dental plate.... S. G. Supplee  
 Dental vulcanizer.... C. A. Davis  
 Derailleur.... G. L. Mausfield  
 Diffusion apparatus.... E. H. Schofield  
 Disinfecting apparatus.... 2 pats. E. Fournier  
 Display rack.... L. Feldmann, Jr. et al  
 Distilling petroleum. Apparatus for continuous.... M. Livingston  
 Dresser.... J. L. Larson

Drill press gearing.... H. Dreses  
 Duplicating device. Manifold H. H. Norrington  
 Dye and making same. Azo.... 2 pats.  
 Dye and making same. Blue sulfur.... E. A. Fourneaux  
 Dye.... A. Schmidt et al  
 Dye. Blue disazo.... A. L. Laska  
 Ear pump.... J. B. Wantz  
 Easel.... R. T. Anthony  
 Electric distribution system.... C. W. Stone  
 Electric elevator.... F. B. Rae  
 Electric machine brush. Dynamo.... W. D. Litchfield  
 Electric machine system. Dynamo.... F. H. Jeannin  
 Electric meter prepayment attachment.... T. L. Arnold et al  
 Electric motor actuating and controlling device.... O. C. Britsch  
 Electric motors. Device for automatically cutting out starting resistances of.... G. H. Whittingham  
 Electric resistance structure.... H. Geisenhoner et al  
 Electric regulator.... E. W. Rice, Jr  
 Electrical distribution.... S. L. Naphtaly et al  
 Electrical distribution system.... A. O. Lunt  
 Electrical distribution system.... 2 pats.  
 Electrical distribution system.... C. P. Steinmetz  
 Electrical distribution system.... E. W. Rice, Jr  
 Electrical machines and appliances. Winding of.... R. Rouge  
 Electrolytic cell.... H. K. Moore  
 Elevator apparatus.... I. H. Venn  
 Elevator controlling mechanism.... T. W. Heermans  
 Elevator guard.... C. D. B. Fisk et al  
 Embroidering machine.... R. Cornely  
 Engine.... T. Officer et al  
 Engine and power transmitting means therefor.... P. Murray  
 Engine electric igniter. Hydrocarbon.... H. M. McCall  
 Engine lubricator. Steam.... G. C. Full  
 Engine regulating device. Internal combustion.... F. Reichenbach  
 Engines. Apparatus for preventing the racing of marine.... E. Hope  
 Engraving machine.... W. S. Eaton  
 Evaporating apparatus.... H. Howard  
 Excavator.... E. V. Grant et al  
 Exhibiting and vending machine A. E. Bennett  
 Exhibition apparatus.... F. W. Kremer  
 Eyelet.... G. E. McCormack  
 Feed water heating system for multiple expansion engines.... B. V. Nordberg  
 Feeder apparatus. Boiler.... J. M. Williams  
 Feeder. Automatic poultry.... L. J. Davis  
 Felt, fabric, or the like. Stretcher for.... E. Dedicke  
 Fence wire stretcher.... C. W. Hoagland  
 Films. Adapter for containing a flat package of.... C. E. Hutchings et al  
 Fire extinguisher. Automatic.... R. W. Newton  
 Firearm. Automatic.... F. R. von Mannlicher  
 Firearm. Barrel lock.... E. Sturgill  
 Firearm. Safety sear.... R. Bloomer  
 Fireplace heater.... T. B. Bayless  
 Fireproof wood, &c., and making same.... J. L. Ferrell  
 Fishing float.... H. J. Cook  
 Fishing reel.... R. L. Hunter  
 Fishing spoon.... C. F. Breidenstein  
 Floor surfacer, cleaner, and polisher.... A. T. Spence et al  
 Folding chair. Combination J. J. Flannery et al  
 Fuel from brea. Manufacture of artificial.... J. T. Davis  
 Furnace.... Wm. Raiton et al  
 Furnace.... P. B. Harrison  
 Furnace bottom.... J. Huxley  
 Furnaces. Pipe stove for heating the blast for.... E. P. Davis  
 Gage.... C. E. Eldridge  
 Galley lock.... A. C. Ladd  
 Game apparatus.... C. O. Sobinski  
 Game apparatus.... C. Tannor  
 Game table.... J. L. Patton et al  
 Game of table or parlor cricket E. M. Amphlett  
 Garment fastening or other holding device.... J. F. J. Gunning  
 Garment hanger.... F. P. Johnson  
 Gas burner lighting device. Incandescent.... J. & G. Keith  
 Gas generator. Acetylene.... A. Hunt et al  
 Gas pressure reducing apparatus A. R. Bullock  
 Gas regulating burner.... C. W. Taylor  
 Gases. Subjecting materials to the action of air or other.... C. E. Mark  
 Gate.... G. Ogden  
 Gate attachment.... O. U. Peterson  
 Gearing. Frictional.... J. Kynoch  
 Gelatin. Making.... W. Cornack  
 Glass cutting apparatus.... H. J. Sage  
 Gold extracting process.... T. B. Joseph  
 Governor.... H. M. McCall  
 Governor. Engine.... J. Hardill  
 Gowns. Guide for the design of ladies'.... A. B. Rheinheimer  
 Grain drill.... A. N. Norris  
 Grain elevator.... J. B. Schuman  
 Grating. Cell.... P. H. Gorman  
 Grave cope.... E. B. Blood  
 Grinding mill cleaner.... H. D. Phillips  
 Gun barrel protector.... B. Robbins  
 Gun sight.... E. W. Hubbard et al  
 Harrow.... W. S. Ross  
 Harrow tooth fastener.... W. D. Whitney  
 Harvester attachment.... L. Franzmeier  
 Harvester frame raising or lowering device.... E. W. Burgess  
 Haulage clip.... J. W. Smallman  
 Hay rakes or other implements. Self-fastening spring tooth for.... J. Macphail  
 Heater.... O. F. Roggenkamp  
 Heel plate.... C. E. McKenna  
 Heel trimming machine upper guard.... E. Villeneuve  
 Hoist circuit breaker.... S. S. Wales  
 Hoisting and conveying cableway.... B. H. Hardaway  
 Hood. Protective.... E. Langer  
 Hook and eye.... M. H. Eismann  
 Hook and eye.... J. F. Schoeppl  
 Horseshoe.... P. Wilburg  
 Horseshoe. Nailless.... J. Surfass  
 Hose coupling.... F. G. Frankenberg et al  
 Hub. Interchangeable.... E. C. Davis  
 Hunting knife.... M. H. Rowland  
 Hydraulic press.... C. Seymour  
 Hydrocarbon burner.... B. N. Hawes

Hydrocarbon burner.... W. De Latimer  
 Ice cutter.... J. Ducharme  
 Image projecting device.... E. M. Barnes  
 Incrustation preventive.... T. G. Lockwood  
 Indexing apparatus.... B. M. W. Hanson  
 Indexing apparatus. Fluid pressure operated.... B. M. W. Hanson  
 Inflammable liquids. Safety device for vessels containing.... V. Posno  
 Ingot mold.... T. Dixon  
 Inkstand.... C. Colombani  
 Innersole cement machine.... G. F. Dunn  
 Insulator.... F. M. Locke  
 Insulator. Electrical.... E. J. Burke  
 Internal combustion engine.... R. D. Chandler  
 Internal combustion engine.... J. H. Jones  
 Ironing board.... A. C. Schatz  
 Japanning small articles. Machine for.... T. A. Perrins  
 Joint casing. Universal.... C. W. Spicer  
 Journal box.... F. H. Crafts  
 Journal lubricator.... J. G. Smith  
 Knitting machine.... L. C. Huse  
 Knockdown bracket.... H. G. Voigt  
 Ladder and window jack. Combined extension step.... W. Young  
 Laminated lever switch.... E. M. Hewlett et al  
 Lamp.... B. Nadeau  
 Lamp chimney holder.... G. W. Blair  
 Lamp. Electric.... A. J. Wurts  
 Lamp. Electric headlight.... H. P. Wellman  
 Lamp. Gas or vapor.... A. Mende  
 Lamp glowers. Apparatus for applying terminal wires to electric.... J. M. Gulentz  
 Lamp glowers. Applying terminal wires to electric.... J. M. Gulentz  
 Lamp heater cut out. Electric.... 2 pats.  
 Lamp. Incandescent vapor.... J. B. Christian  
 Lamp. Oil.... M. & H. Romans  
 Lamp. Vapor.... A. J. Simpson, Jr  
 Lantern.... G. W. Manley  
 Latch and door. Electrically operated.... J. Chambers, Jr  
 Lathe change gearing.... A. E. Newton  
 Lathe taper attachment.... J. M. Kingston et al  
 Leather. Stirrup.... J. P. Wroe  
 Life preserver.... W. N. Morrison  
 Life saving appliance.... C. J. Dampf  
 Lift cutting and heel building apparatus.... D. M. Beck  
 Lignure receptacle. Aseptic.... H. L. Cox  
 Lineman's implement.... S. Kirliu  
 Link forming machine.... A. S. Standish  
 Linoleum or like coated fabrics. Composition for use in manufacture of.... J. A. Shepherd  
 Liquid fuel burner.... N. Beck et al  
 Lock and latch. Combined.... M. C. Patrick  
 Loom shuttle.... H. Cote  
 Loom shuttle. Self-threading.... 2 pats.  
 Loom shuttle. Weavers.... G. Fair  
 Magneto generator.... E. G. Ferreira  
 Mail box.... G. E. Wheeler  
 Mail box.... W. B. Barnes  
 Mail box.... S. S. Langford  
 Mailing tube.... L. Patterson  
 Mailing wrapper.... L. E. Barnes  
 Malt, grain, seeds, &c. Apparatus for cleaning.... O. G. C. L. J. Overbeck  
 Manager's reference system.... H. H. Mayberry  
 Manifold sheet.... H. M. Hay  
 Manifold device.... J. O. Decker et al  
 Match box.... C. J. Ulbricht  
 Mattress.... C. B. Meeker  
 Maximum demand indicator.... F. P. Cox  
 Measuring instrument.... W. L. West  
 Measuring instruments. Means for compensating temperature changes in electrical.... W. H. Pratt  
 Measuring machine. Self-registering cloth.... W. M. Thompson  
 Meat chopper geared driving attachment.... E. C. Pollard  
 Mechanical movement.... R. F. Hargraves  
 Memory jogger.... A. G. Blincoe  
 Metal structure. Expanded.... H. E. White  
 Metal wheels. Making.... G. W. Packer  
 Metallic mat.... G. W. Walters  
 Metals. Means for precipitating dissolved.... P. W. McCaffrey  
 Microtome.... E. Bausch et al  
 Milk aerator.... J. A. Tientlage  
 Motor control system.... F. E. Case  
 Motor control system.... W. B. Potter  
 Motor with rotating piston.... G. Silvestri  
 Mowing machine.... E. A. Johnston  
 Mowing machine attachment.... W. Hord  
 Mucilage or paste pot.... J. Maine  
 Music box.... W. A. Drysdale  
 Musical instrument. Stringed.... J. Ludstrom  
 Necktie fastener.... C. A. G. Knoll  
 Numbering machine.... T. H. Boss  
 Nut finishing machine.... G. Dunham  
 Nut lock.... J. C. Foster  
 Nut lock.... C. C. Border  
 Nut locking washer.... L. T. Stephenson  
 Oil can.... J. A. Baerle  
 Ore washing pan.... J. A. Creasy  
 Organ octave coupler. Reed.... S. Jenkinson  
 Ornamental ring.... L. E. Sadler  
 Outdoor seat.... J. T. Dawson et al  
 Paddle wheel.... J. Rourke  
 Paint spraying apparatus.... R. W. Bird  
 Paper folding machine.... W. F. Liddle  
 Paraffin fabric.... C. C. Hoyt  
 Pea hulling machine.... W. F. Pillmore et al  
 Perambulator.... G. D. Leadbetter  
 Photocopying machine.... P. Latta  
 Photographic developing apparatus.... J. W. Meek  
 Photographic film package. Flat form.... C. E. Hutchings et al  
 Photographic plate developing apparatus.... L. Brown  
 Photographic printing.... E. S. Shepherd et al  
 Photographic purposes. Copying material for.... R. Krayn  
 Piano action bracket.... E. Bornhoeft  
 Piano action. Upright.... E. Bornhoeft  
 Picture holder.... E. C. Eiherton et al  
 Pie machine.... H. H. Jones  
 Pipe protector. Sanitary.... T. Lovely  
 Plant cover.... J. L. Larson  
 Planter. Combined seed.... P. Le Suer  
 Planter. Corn.... H. D. Smith  
 Planter. Seed.... J. H. Beddingfield  
 Plow.... L. A. Meyburn  
 Plow.... E. P. Curry  
 Plow disk jointer.... T. L. Bolser  
 Pole changer.... J. Crawford  
 Pool table rack and tally.... G. F. Goss

Potatoes. Composition for bleaching.... A. Danmar  
 Printing machine for printing yarns, &c. Automatic color.... O. Hallensleben  
 Printing press motor bracket.... F. R. Rich  
 Printing presses. Apparatus for cleaning, drying, and polishing inking rollers of.... V. Bauer  
 Printing presses. Registering wood base cuts on.... E. J. Jones  
 Pulley or wheel. Friction.... W. D. Huse  
 Pulp, &c. Apparatus for straining paper.... J. White  
 Pulp. Manufacturing perforated sheets of wood.... G. S. Lindberg  
 Pump handle bearer.... T. E. Long  
 Pump operating device. Air.... R. D. Albright  
 Punch. Check.... W. J. Keuderline  
 Purifying apparatus.... P. J. Boucher  
 Puzzle.... B. G. Lamme  
 Quilting frame, cot, and ironing board holder. Combined.... F. G. Dieterich  
 Rail joint.... K. Kohn  
 Rail joint bed plate.... J. R. Bitner  
 Railway. Elevated electric.... W. Varzar  
 Railway jack. Wheel clamp.... A. L. Casebeer  
 Railway rail joint.... W. M. Brewer et al  
 Railway rail joint.... G. E. Daggett  
 Railway rails upon wooden ties. Fastening.... J. Copeland  
 Railway signal.... reissue.... J. D. Price  
 Railway switch.... A. H. Vandling  
 Railway switch operating mechanism.... E. Ruby  
 Railway. Third rail electric S. B. Stewart, Jr  
 Railway track rails. Device for preventing the spreading of.... C. A. Alkins  
 Railways or tramways. Permanent way of.... A. Ambert  
 Reaper or mower attachment.... J. F. Sickenberger  
 Reclining chair.... O. J. Mattax  
 Rectifier.... W. Stanley  
 Refrigerating means.... A. F. George et al  
 Reservoir construction.... P. Evans  
 Retort discharging apparatus.... M. Graham  
 Revolving bodies. Instrument for locating over balance in.... O. Snel  
 Riveting brace.... J. L. Pearson  
 Road roller.... W. M. Fawcett et al  
 Roasting apparatus.... C. Cretors  
 Rock drill. Hand.... V. Y. Smith  
 Rolling and trimming machine.... J. Ditson  
 Rolling blanks for I-beams or girders.... R. D. York  
 Rolling mill pinion housing.... O. N. Rauschenberg  
 Rolling mills, shafts, &c. Automatic controller for.... C. Kuhlewind  
 Rope.... B. Kirsch  
 Rotary engine.... M. J. Hewlett  
 Rotary engine.... W. H. Masterman et al  
 Rotary engine.... G. P. Breed et al  
 Roundabout or pleasure railway.... J. M. Taylor  
 Rubber tired wheel.... R. Mulholland  
 Rule. Lumber.... J. F. W. Ritsch  
 Sad iron.... A. J. Campbell  
 Safety stopper.... I. Timar  
 Sash fastener.... A. Carlson  
 Sash or sliding door attachment. Window.... P. McCabe  
 Saw filing gage.... S. J. Galloway  
 Sawing machine.... O. Nordberg  
 Scaffolding support.... A. Meucarski  
 Scale.... J. Hotsapillar  
 Scale.... W. H. Sanderson  
 Scholar's companion.... reissue.... A. W. Trescott  
 Scrubbing device. Floor.... M. C. Bliss  
 Scrubbing machine.... P. Cecil  
 Seat back.... R. P. Elliott  
 Seed hulling and breaking machine. Cotton.... M. F. Williams  
 Sewing machine. Hat.... E. G. O'Donnell  
 Sewing machine slack thread take up.... J. Diehl  
 Sewing machine stop mechanism.... D. Mills  
 Shade. Collapsible sun or rain.... L. Seeger  
 Shade roller cap.... W. Bucholt  
 Shade trimming machine. Window.... G. W. Steffe et al  
 Shafts. Fastening device for connecting collars and.... L. F. Fales  
 Shaper table support.... S. G. Chambliss  
 Sheaf carrier.... H. F. Crandall  
 Sheet drier.... A. K. Taylor  
 Shipping or traveling case.... C. R. Walter  
 Shirt waist.... W. H. Hamilton  
 Shocker. Bundle.... J. G. Hoffman  
 Shoe.... C. C. Hoyt  
 Shoe heater.... M. C. Gerard  
 Shoe horn.... A. D. Washington  
 Shoe stamping machine.... J. J. Heys  
 Sifting apparatus.... E. Maag  
 Signal system.... J. K. Reid  
 Signaling device. Electric.... G. E. Clark  
 Sign. Illuminated.... C. E. Lee  
 Sizing.... G. Fredenburgh  
 Skeining machine.... J. H. Shearn  
 Skirt gage.... J. B. McFarrich  
 Skirt hook.... J. A. Savage  
 Slack adjuster. Automatic.... F. L. Clark  
 Slag furnace.... 2 pats. O. S. Garretson  
 Sleigh knee.... F. Kamke, et al  
 Smelting. Matte or pyritic.... O. S. Garretson  
 Snow plow.... F. A. Brigham  
 Sound or speech. Diaphragm for machines for recording or reproducing.... J. C. English  
 Sound record of cylinders. Apparatus for forming duplicate.... A. N. Petit  
 Sounding apparatus. Navigational.... J. C. Dobbie  
 Speed mechanism. Variable.... A. Mill  
 Speed mechanism. Variable.... F. C. Miller  
 Speed regulator. Spring motor.... G. W. Merrill, Jr  
 Spinning spindles. Automatic filtering lubricator for the bushings of.... J. L. Geis  
 Stacker. Pneumatic.... F. L. Stallard  
 Stamp mill stamps. Hanging up or throwing out of operation.... J. J. Smythe  
 Stamping press.... J. J. Heys  
 Stauchion. Cattle.... H. Taylor  
 Starching machine.... 2 pats. W. M. Barnes  
 Starting machine.... J. F. Carr  
 Steam boiler.... C. Olson  
 Steam boiler.... C. Cretors  
 Steam boiler.... W. C. Lockwood  
 Steam engine. Compound.... J. Hardill  
 Stoker. Mechanical.... T. R. Butman  
 Stoker or feeder. Automatic coal.... P. W. Lichtenberger et al  
 Stool and quilting frame. Combined.... J. Fitzgerald



Storage battery..... A. W. Charlton  
Storage battery..... M. Emme  
Storage battery..... J. C. Brocksmith  
Stove automatic cut-off. Gas..... F. C. Miller  
Stove. Heating..... J. H. Waters  
Stovepipe for flue cleaning..... H. M. Shields  
Stump extractor..... O. J. Dahl  
Stump puller. Portable..... T. A. Kundson  
Sugar constituents. Extracting..... L. Naudet  
Surgical instrument..... L. Levi  
Surveying instrument illuminator.....  
Suspenders..... C. M. Bernegan  
Tachometer..... H. C. Hine  
Tack extractor..... W. P. Wiemann  
Talking machine sound box..... E. D. Gleason  
Tandem engine. Compound..... J. Hardill  
Tank cleaning mechanism..... W. B. Hogg  
Telegraph. Facsimile..... H. Liebreich et al  
Telegraphy. Wireless..... J. F. King  
Telephone lock..... E. G. Lewis  
Telephone pay station coin collector.....  
Telephone receiver..... G. E. Scribner  
Telephone system..... E. Umdenstock  
Telephone transmitter..... G. E. Wheeler  
Telephone wire hanger..... H. F. Neslage et al  
Tile. Floor..... A. Plant  
Tire. Resilient..... L. C. Cummings  
Tire tightener..... J. B. Smith  
Toe weight..... W. E. Sell  
Tongue supporter. Vehicle..... J. Calkins  
Tool. Magazine..... J. M. Barstad  
Toy. Parachute..... S. S. Lawrence  
Toy vehicle..... H. N. Parker  
Trace fastener..... J. E. Henderson  
Trace fastener..... J. Morrison  
Track holder..... J. N. Metzger  
Tracks. Means for operating the points on tramway or like..... S. Zylberlast  
Traction system..... E. L. K. F. Kahlenberg  
Transformer..... G. H. Hill et al  
Tree leg stretcher or holder attachment.....  
Trolley..... P. J. McGrath  
Truck. Car..... G. E. Smith  
Truck. Car..... J. A. Brill  
Truck. Railway car..... 2 pats. H. R. Keithley  
Tube handling apparatus..... T. J. Bray, Jr  
Tunnel ventilating apparatus. Railway.....  
Type carrier and selecting mechanism H. Hill  
Type writer..... C. Wasmuth  
Type writer. Copy holder..... R. J. Wood  
Type writing machine. Copy holder E. C. Price  
Umbrella..... J. A. Hollenberger  
Upholstery spring..... W. K. Parker  
Vaccination or other tumors. Shield for.....  
Valve..... E. S. Oliver  
Valve. Adjustable rotary..... A. S. Tuttle  
Valve. Air..... G. Schneider  
Valve. Filling..... A. Schneider  
Valve gear. Steam engines..... R. L. Campbell  
Valve. Oscillating..... G. L. Wackerow  
Valves. Glass seats for ball..... L. W. Eggleston  
Vault. Burial..... B. F. Van Camp  
Vehicle brake..... J. T. Hovis  
Vehicle heating system. Motor.....  
Vehicle. Land and water..... W. O. Worth et al  
Vehicle. Lever..... A. Piller  
Vehicle. Motor..... J. Scott  
Vehicle. Motor..... J. C. Reuter  
Vehicle running gear..... J. S. Layton  
Vehicle wheel..... H. M. O. Malley  
Vehicles. Collector for use on electrically propelled or lighted..... B. H. Bedell  
Vehicles. Differential gear for motor.....  
Vending apparatus..... M. G. De Simone  
Vending machine..... J. J. Reed  
Vending machine..... W. W. Rosenfield  
Ventilator..... E. Shaw  
Voting machine..... F. C. Foos et al  
Wagon. Dumping..... A. A. Farwell  
Wagon. Dumping..... W. E. Currie et al  
Wagon. Dumping..... J. T. Droste  
Wagon. Dumping..... E. A. Godfrey  
Wagon gear. Short turn..... T. Sandstrom  
Wagon. Lumber..... O. C. Nickerson  
Wagon rack. Convertible..... I. W. Snow  
Wall. Provisional or permanent J. Kulhanek  
Wardrobe..... J. O. Clay  
Washing machine..... O. H. Larson  
Watch safeguard..... H. M. Willis  
Water arch..... I. M. Riles  
Water closet..... F. Schun  
Water closet flushing apparatus A. Kulhanek  
Water heater and condenser. Combined.....  
Water level indicator..... W. Tate et al  
Water wheel bucket..... F. E. Stanley  
Waterway. Pleasure..... G. J. Henry, Jr  
Weaver. Cow or calf..... M. S. Quiggle  
Weather strip..... A. J. Kitson  
Weather strip..... E. Donden et al  
Web roll shaft..... F. Meisel  
Weed extirpator..... B. Smith  
Weighing machine..... L. Hachenberg  
Weighing machine. Coin operated.....  
Weir cutting machine..... J. Morgenthau  
Wind motor governor..... W. B. Arnold  
Windmill..... F. W. Hedgeland  
Windmill..... W. F. Kerr  
Windmill..... G. S. Lowell  
Windmill regulator..... G. E. Steenrod  
Window strip. Revolving..... H. E. Essig  
Window ventilator..... T. T. Doll  
Wire forming machine..... A. C. Campbell  
Wire rope fastening device..... M. am Ende  
Wire strainer..... J. Brown  
Wire stringing apparatus..... E. E. Salisbury  
Wire tightener..... G. Robinson  
Woven fabrics. Apparatus for preventing production of reed stripes in..... N. J. Chaize  
Wrench..... J. J. Quinlan  
Wrench..... C. F. Doeblor

## DESIGNS.

Cup..... R. L. Johnson  
Dish. Covered..... R. L. Johnson  
Dish holder standard..... N. Simmer  
Lamp. Gas..... A. H. Humphrey

Issued May 26, 1903.

## MECHANICAL PATENTS.

Acid. Amido oxybenzyl sulfonic.....  
..... F. Fischer et al

Acid. Apparatus for making sulfuric.....  
Advertising and playing board. Combined.....  
Agricultural machines to motors. Means for coupling..... A. Castelin  
Air ship steering mechanism. Dirigible.....  
..... L. A. Boswell  
Altitude instrument..... E. G. Hewett  
Amusement apparatus..... T. Folks  
Animal catching and holding device F. C. Guss  
Ant trap..... W. F. Finley  
Armature. Induction motor..... E. Thomson  
Astronomical instrument..... E. G. Hewitt  
Atomizer holder..... J. C. Cramer  
Automatic switch..... F. R. S. Dittmars  
Automobile steering wheel..... H. W. Meyers  
Back band hook..... E. L. McClain  
Baling machine. Fiber..... J. J. Davenport  
Baling press..... J. J. Jensen  
Ball coupling..... H. T. Henderson  
Bank. Registering..... J. Daly  
Battery chute..... F. E. Paradis  
Battery circuit breaker. Storage..... H. Garrett  
Battery separator. Storage..... E. A. Sperry  
Beams together. Means for clamping and securing cross metal..... H. A. Streeter  
Bearing..... G. W. King et al  
Bearing for drawers, &c. Roller A. C. Pickard  
Bearing. Spindle..... T. Watson  
Bed. Couch..... D. Frank  
Bed. Invalid..... J. Cheetham  
Bed spring..... F. J. & W. C. Van Cise  
Bedstead fastener..... F. Schmidt  
Beet pulling machine..... H. G. Hotchkiss  
Belt fastener..... J. M. Erickson  
Bicycle delivery attachment..... W. Mosley  
Binder. Loose leaf..... R. B. Wilson  
Blower and fire screen. Fire..... P. Grayson  
Boat wagon. Life..... O. C. Nickerson  
Boiler cleaner..... D. F. Schuler  
Boiler flue cutter..... J. T. Warner  
Boiler. Fusible plug steam..... M. K. Bowman  
Bolt holder..... W. J. Phillips  
Bookcase. Sectional..... R. Hatch  
Bookcases or the like. Door for..... O. O. Buice  
Books and cutting the edges thereof. Machine for feeding..... E. Grosse  
Boring tool..... E. W. Williams et al  
Bottle..... W. F. Hutchinson  
Bottle..... P. J. Wilson  
Bottle closure..... C. J. Gustavson  
Bottle detector. Refilled..... A. C. Nicklory  
Bottle. Non-refillable..... W. B. Hargan  
Bottle or similar receptacle closure.....  
..... W. L. Rose  
Bottle stopper..... O. Grozinger  
Bottle wire cutter..... J. Trafford  
Bowling alley pin spotter..... C. L. Bastain  
Box. Cabinet, &c..... J. T. Hoyt  
Box fastener..... P. V. Day  
Box tool..... E. Marcille  
Breastpin pin tongues. Hinge joint for.....  
..... E. W. Morehouse  
Brick. Building..... E. H. Vordtriede  
Brick clay crusher rolls..... J. H. Bach  
Brick kiln door..... S. A. & J. M. West  
Brick machine..... D. B. Price  
Bridge construction..... J. Tomlinson  
Brooch..... E. B. Hough  
Brooder. Chicken..... H. E. Bradshaw  
Broom holder, clothes rack, and towel hanger. Combined..... O. S. Perkins  
Brush..... H. L. King  
Brush..... A. Steele  
Brush and making same..... W. J. Wallace  
Brush holder..... T. L. Hawkins  
Brush. Scrubbing..... J. Beeby  
Buffing machine..... A. Buteau  
Bung. Tapping..... A. F. Lent et al  
Bunsen tube for incandescent light, heating, or cooking apparatus..... C. P. Ehmman  
Burglar alarm..... B. Arthurs  
Cabinet. Knockdown..... M. Loeffel  
Calcium carbide package..... J. Ewing, Jr  
Calendar..... G. G. Graessle  
Calendar..... G. H. T. Scribner  
Calendar machine..... J. Kleinewefers  
Camera..... H. Goodwin  
Camera..... 2 pats. G. H. Lee  
Camera controller..... W. D. Macdonald  
Camera, stereoscope, and opera glass. Combined..... L. Raucoule  
Can..... W. T. Coghlan  
Canal system. Electric..... F. Adams  
Canes or like articles. Handle or head for.....  
..... G. B. Leplinger  
Car brake..... C. A. Kleiner  
Car coupling..... P. C. Ewart  
Car coupling..... C. C. Bowen et al  
Car coupling..... J. C. Yeiser  
Car door. Grain..... F. R. Finberg  
Car. Freight..... H. A. Turner  
Car. Steel gondola..... A. B. Bellows  
Car ventilator..... E. F. Crowther  
Car wheel..... R. P. Tomassek  
Car wheel bearing..... J. Stuart  
Car wheels. Casting steel..... T. Mitchell  
Cars. Means for operating reversing switches on electric..... E. R. Gill  
Carburetor..... R. Dempster  
Carbureting device for explosive engines.....  
..... M. F. Bates  
Card punching machines. Apparatus applicable to jacquard..... T. Hill et al  
Card punching machine. Jacquard.....  
..... W. W. Hodgson  
Carpet fastening device..... C. W. Harris  
Carriage apron..... A. B. Keys  
Carriage door..... J. Polya  
Carriage. Folding..... G. Holtz  
Carriage mechanism..... J. J. Green  
Cart. Dumping..... A. Brenzinger  
Cart. Road..... H. J. Miller  
Castings. Making steel..... W. E. Covan  
Cattle guard..... G. G. Welsh  
Centering and holding tool..... P. Gagnou  
Centrifugal machine brake..... G. Pott et al  
Chain link. Couveyer..... J. L. Pittman  
Chair head rest..... R. S. Gibson  
Christmas tree holder..... A. Wegener  
Cigarette former..... C. A. Beatley  
Circuit breaker..... C. H. Noswood  
Circuits. Current transformer for high voltage..... A. R. Everist  
Clarinet..... P. Evette  
Clay mill pans. Device for emptying R. Kyler  
Clocks. Pawl and ratchet mechanism for electric..... A. Barr et al  
Closet or case..... A. F. Conant  
Cloth cutting machine..... F. Buchwald

Clothes pin..... A. W. Alexander  
Clutch mechanism..... O. Miller  
Clutch mechanism. Friction G. F. Wissmann  
Coal digger..... Z. Scott  
Cock. Compression stop..... E. Scheiber et al  
Coke oven..... G. M. Miller  
Composition of matter..... G. Blenio  
Composition of matter..... 2 pats. M. Molchin  
Compositions of matter. Forming M. Molchin  
Condenser. Steam..... R. H. Hornbrook  
Convertible chair..... W. W. Lepard  
Corn knife..... O. P. Muller  
Cornstalk shredder..... L. D. Swart  
Cot. Folding..... A. Cantor  
Counting pieces of goods. Apparatus for.....  
..... A. Christerson  
Crane. Erecting..... J. H. Ames  
Cream separator. Centrifugal W. C. Hartmann  
Crupper blind..... R. B. Benford  
Cuff holder..... J. H. & A. I. Dwork  
Cuff holder..... J. L. Havlin  
Curling iron heater..... C. E. Huff  
Current motor. Alternating..... C. P. Steinmetz  
Cut-off. Automatic..... R. P. Barnstead  
Cycle gear. Motor..... E. Mathieu  
Cylindrical surfaces. Instrument for truing up..... J. M. Griffin et al  
Decolorizing and clarifying material. Manufacturing..... R. L. Jenks  
Diseases by electromusical vibrations. Means for treating nervous..... H. Fleetwood  
Disinfecting apparatus..... C. J. Walz  
Display apparatus..... S. R. De Long  
Doors. Hatches, or the like. Electrically operated system for closing water tight.....  
..... W. B. Cowles  
Dough raiser..... L. McCombs  
Drawer. Extension..... D. E. Hunter  
Drill/operating mechanism..... J. D. Cloud et al  
Dumb bell..... F. W. Hale  
Dust guard..... R. J. Evans  
Dye. Anthracene..... M. Kugel  
Eccentric..... J. W. Davis  
Edge trimmer. Rotary..... M. J. McGrath  
Electric arc light..... W. C. Fish  
Electric battery..... E. Tweedy et al  
Electric circuit making and breaking mechanism..... H. B. Wren  
Electric display apparatus. Interchangeable..... D. Levy  
Electric heater..... E. F. Porter  
Electric heater..... M. Loewenthal  
Electric light and power self regulating system..... M. Moskowitz  
Electric machine. Dynamo..... H. G. Reist  
Electric machinery. Dynamo..... H. M. Hobart  
Electric protective device..... C. P. Steinmetz  
Electric signal..... A. E. Canthey  
Electric switch..... H. Bayer  
Electric switch..... T. Muller et al  
Electrical and selective distribution..... J. S. Stone  
Electrical and selective distribution. Electrical apparatus and circuits for..... J. S. Stone  
Electrical conduit attachment..... A. McMurtrie  
Electrical conduit coupling..... A. McMurtrie  
Electrical cut-out and regulator H. Leitner et al  
Electrical distribution system..... 2 pats. C. P. Steinmetz  
Electromagnetic wave receiver..... reisse  
Electrothermic instrument..... R. A. Fessenden  
Elevator..... 2 pats. A. C. Smith  
Elevator safety device..... J. Hosler  
Elevator safety stopping device..... I. H. Venn  
End gate. Wagon..... A. C. Bowker  
Engine bed anchor device..... C. E. Baker  
Engine electrical ignition apparatus. Gas.....  
..... W. E. Dow  
Engine igniter. Gas..... J. MacHaffie  
Engine sparking igniter. Explosive.....  
..... A. C. Mather  
Envelope..... F. S. Boedfeld  
Envelope..... S. N. Fieger  
Envelope fastener..... M. H. Jolsinger  
Eraser shield..... H. E. Gero  
Excavating apparatus..... A. J. Mason  
Expansion bolt..... W. C. Boone  
Explosion engine..... J. C. White  
Eyeglass spring..... G. W. Wells  
Eye shade..... W. F. Mahony  
Fabrics. Rolls for compound indenting of sheet..... J. Arkell  
Feed apparatus. Portable..... A. A. Hoyt  
Feed bag..... G. H. Nissen  
Feed water heater..... D. B. Cumming  
Feed water heater..... F. L. Patterson  
Feed water heater, filter, and purifier.....  
..... M. P. Osbourn  
File and paper holder. Bill..... J. M. Erickson  
File holder. Office..... J. C. Brandes  
Filing case..... J. Lee  
Filter..... G. Engel  
Finger ring. Ornamental..... J. Anthony  
Firearm. Automatic..... J. J. Reifgraber  
Fire escape..... J. Spuck  
Fireproof building structure..... C. M. Ellinger et al  
Fireproof buildings. Ceiling or wall construction for..... W. Horn  
Fireproof floor construction..... C. F. Bueute  
Fireproof wall or building..... G. W. Pickin  
Fish plate forming machine..... R. B. Charlton  
Fishing rod holder..... T. J. Briner  
Flier..... F. J. Rabbeth  
Flue stopper..... M. L. Greenstreet  
Fluid compressor..... G. V. Mitchell  
Fluid motor. Expansive..... J. A. Norton  
Fluid motor. Expansive..... J. A. Norton et al  
Fluid motor. Expansive..... J. A. Norton  
Fly catcher..... J. E. Cox  
Folding box..... F. M. Wade  
Folding box..... Z. B. Webb  
Fruit sorter..... A. C. Niemann  
Fuel briquets. Machine for making artificial.....  
..... G. M. Fenn  
Fuel composition. Preparing..... O. Francke  
Fuel compound. Emulsion..... 2 pats. W. F. Browne  
Fuel economizer..... G. H. Burpee  
Fuel feeder. Pulverized..... J. J. de Kinder  
Fuel feeding mechanism..... J. J. de Kinder  
Furnace for heating metal sheets.....  
..... J. Stephens et al  
Furnace hearth. Blast..... M. M. Suppes  
Furnaces. Apparatus for feeding pulverulent and small fuel to..... O. E. Wilson  
Furnaces. Means for stoking C. B. Miller et al  
Furniture. Adjustable..... R. P. Elliott  
Fuse block. Magazine..... G. Baskerville  
Game piece..... F. A. Cigol

Garment supporter. Safety..... E. E. Heilbron  
Gas apparatus. Acetylene..... J. J. Hendler  
Gas burner..... J. A. Scholz  
Gas burner..... C. T. Willson  
Gas burner..... R. Steilberg  
Gas burner. Acetylene..... J. B. Carroll  
Gas burner and self igniter..... C. T. Willson  
Gas burners. Manufacturing acetylene.....  
..... J. B. Carroll  
Gas check for Bunsen burners..... A. A. Ury  
Gas drying apparatus..... G. G. Smith  
Gas engine..... J. MacHaffie  
Gas. Enriching..... F. W. C. Schriewind  
Gas generator. Acetylene..... H. L. Pyle  
Gas governor..... D. H. Bumpus  
Gas motor. Rotary..... C. Hoff  
Gear. Variable speed and reversing R. Mathot  
Gearing..... W. R. Green  
Gluing articles together..... F. Renken  
Governor mechanism..... F. C. Rinsche  
Governor and gas and air mixer for explosive engines. Combined..... W. F. Meister et al  
Grain binder knoter..... W. Newman  
Grain elevator construction..... I. Cohen  
Grain treating and drying apparatus.....  
..... H. J. Caldwell et al  
Grease. Separating..... E. R. Edson  
Grinding or sharpening machine..... A. Mathieu  
Gun for shooting marbles..... S. H. Strasser  
Gun mounting or carriage..... C. Holmstrom et al  
Gun sighting apparatus..... C. P. E. Schneider et al  
Gun stock. Adjustable..... J. C. Yount  
Guns and for testing the correctness of the aiming. Instrument for indicating and recording the aiming of naval..... C. J. A. Dick  
Guns. Instrument for indicating and recording the aiming of naval..... C. J. A. Dick  
Handle bar..... J. Robertson  
Hanger bracket..... O. S. Perkins  
Harness attachment..... J. S. Barclay  
Harness or heddle bars. Clamping device for..... C. D. Whiting  
Harrow..... F. Hanson  
Harvester. Pea..... T. G. Gordon  
Harvester snapping rolls. Corn..... H. L. Steel  
Harvesting machine flax attachment.....  
..... H. Green  
Hat holder. Milliner's..... S. S. Torrance  
Hay rake. Horse..... A. F. Brown et al  
Heating fabric. Electric..... J. M. C. Herrgott  
Heating furnace. Continuous..... H. V. Loss  
Heating furnace. Double hearth P. Patterson  
Heating pad. Electric..... W. Rickards  
Heating system. Steam..... A. McGonagle  
Heddle and leno cord stripe motion. Needle.....  
..... H. H. Sutcliffe  
Heddle bar or support clamping device.....  
..... W. F. Draper  
Hinge..... B. Peterson  
Hinge. Coach..... F. P. Pfeighar  
Hinge joint..... R. A. Moore, Jr  
Hoisting and conveying apparatus..... J. H. Dickinson  
Hoisting device..... E. Stowell  
Hoisting jack..... S. Popky  
Hoisting machinery. Automatic tripping device for..... T. E. Mahoney  
Hoof trimmer..... C. E. Shaffer et al  
Hoof trimming nippers..... J. M. Bryant  
Horseshoe..... A. F. Mohn et al  
Hose coupling..... J. Wittman  
Hub band cap..... W. A. Schleicher  
Hub band cap..... C. A. Tower  
Hydraulic motor..... H. F. Sawtelle  
Hydrocarbon burner..... C. Ball  
Hydrocarbon burner..... J. H. Morrissey  
Ice cream freezer..... W. C. Fawkes  
Ice cream. Making block..... H. Yeager et al  
Ice cream mold..... H. Yeager et al  
Ice cutter..... H. Bodenstern  
Ice machine skimming regulator..... C. S. Clark  
Ice machine skimming regulator..... 2 pats. A. H. Hutchinson  
Index tray or cabinet. Card..... W. H. Tucker  
Indicating instrument..... C. D. Haskins  
Indigo. Making brom..... A. Rahtjen  
Induction motor..... H. S. Meyer  
Ink fountain..... W. Spalckhaver  
Insecticide..... E. A. Bourlon  
Jar closure..... P. Astryke  
Kerite compound. Vulcanized..... W. R. Brixey  
Keyboard instruments. Means for modifying the action of strikers in mechanism for playing..... R. W. Pain  
Knife construction..... W. Carman  
Knitting machine..... B. T. Steber  
Knitting machine. Circular rib..... F. Lasher  
Knitting machine needle actuating device.....  
..... F. Lasher  
Knob lock. Door..... E. E. Flora et al  
Label holding pull..... C. F. Kade  
Lace fastening..... H. C. Evans  
Lamp. Acetylene gas street..... H. M. Hastings  
Lamp. Alternating current arc..... M. H. Baker  
Lamp bulb blowing off machine..... A. Swan  
Lamp chimney. Expansive and contractible.....  
..... A. H. Stump  
Lamp. Electric arc..... J. O. Girdlestone et al  
Lamp. Gas arc..... C. A. Haas  
Lamp. Hanging..... C. M. Pitel  
Lamp. Incandescent electric..... H. J. Jaeger  
Lamps. Starting means for vapor electric.....  
..... S. E. Flichtner et al  
Laud scorer, ballast dresser, and weed cutter.....  
..... H. Jordan  
Lands. Mechanism for treating arable.....  
..... L. Kavanaugh  
Lantern..... E. F. Weidig  
Last. Boot or shoe..... A. Lewis  
Last. Boot or shoe..... H. W. Mobbs  
Latch and lock..... G. S. & F. O. Parsons  
Lathe dog. Clamp..... H. H. V. Lilley  
Lathes. Feed indicator for screw cutting on.....  
..... F. A. Japs  
Laundry fork..... F. N. Karbach  
Laundry indicator..... L. Childress  
Leather staking machine..... E. Printz  
Letter box lid operating device..... G. E. Renton  
Letter box. Rural delivery..... C. P. Young  
Level and attachment. Combined H. J. Wolfe  
Lifting device..... B. F. Lanham  
Lighting device..... L. Erikson  
Lightning arrester..... A. J. Wilson  
Line switch. High potential..... E. M. Hewlett  
Linoleum products. Making..... L. W. Seeser  
Liquid and gaseous fuel burner J. W. Bain et al  
Liquids. Apparatus for drawing gaseous.....  
..... A. C. J. Charlier  
Loading or unloading apparatus A. G. Flesher  
Lock..... B. Revor



Locking hanger.....L. Steinberger  
 Locking mechanism. Coin controlled.....W. H. Scott  
 Loom. Filling replenishing.....E. S. Stimpson  
 Loom harness mechanism.....E. S. Stimpson  
 Loom harness retractor.....C. I. Knox  
 Loom heddle frame.....R. G. Wirtalla  
 Loom. Leno weaving.....W. Tallant  
 Loom let off mechanism.....J. J. Muldowey et al  
 Loom picker checking means.....A. Eaves  
 Loom picker stick check.....G. M. Smith  
 Loom protector mechanism.....H. W. Bracken  
 Loom selvage motion.....C. H. Draper  
 Loom shedding mechanism.....A. D. Emery  
 Loom shuttle. Self threading.....J. Northrop  
 Loom warp beam.....A. Jobert  
 Loom. Weft replenishing.....I. F. Peck  
 Machinery timing apparatus and alarm.....D. Anderson  
 Magnet structure. Field.....H. G. Reist  
 Manhole cover.....C. E. Burney  
 Manure spreader.....L. Kniffen  
 Match lighter and box.....P. C. Schmidt  
 Matches, tickets, or the like. Receptacle for.....S. M. Shattuck  
 Mechanical members. Means for joining.....A. Newell  
 Metal balls. Machine for making.....H. A. Williams  
 Meat cutting tool. Rotary.....A. Tindel  
 Metals. Uniting.....J. M. Anderson  
 Mirror.....2 pats.....F. Jaeger  
 Mold.....J. B. Stein  
 Monument.....E. C. Scott  
 Monument.....E. C. Hodges  
 Monument.....S. D. McNeal  
 Motor.....C. Campus  
 Motor.....E. Huber  
 Motor control system.....2 pats.....W. H. Powell  
 Motor control system.....C. E. Barry  
 Mower. Lawn.....H. F. Schroeder  
 Mower reaping attachment.....E. A. Johnston  
 Music leaf turner.....J. G. Meziere  
 Musical instrument.....H. H. Brennan  
 Musical instrument. Key actuated.....V. Bessier  
 Musical instruments. Primary pneumatic valve in mechanism for playing.....K. W. Pain  
 Musical string truing device.....C. A. Graham  
 Nail, spike, or other driven holdfast device.....C. Hass  
 Necktie band fastener.....C. W. T. Davies  
 Necktie fastener.....C. E. Gleason  
 Nut lock.....H. E. Stevick  
 Oil engine.....J. S. R. D., W. D., & H. C. Cundall  
 Oil. Producing paint.....E. C. Holton  
 Oil stone box.....J. W. Currier  
 Ore roaster.....H. M. Sutton et al  
 Ore roasting furnace.....J. B. F. Herreshoff  
 Ores. Means for treating.....F. D. Gross  
 Ores. Roasting.....H. M. Sutton et al  
 Organs. Liquid pressure engines for blowing.....H. Swanton  
 Overcheck crown piece attachment.....W. M. Rheubottom  
 Oxidizing organic compounds.....M. Moest  
 Packing for piston rods. Metallic.....C. A. Daniel  
 Packing. Metallic.....R. D. Smith  
 Paint or protective composition.....E. G. Bertrand  
 Painting apparatus. Can.....F. Sejuoha et al  
 Painting machine. Can.....F. Sejuoha et al  
 Pan lifter. Automatic spring.....T. T. Smith  
 Panoramic cabinet.....A. M. Woodward  
 Paper box.....B. H. Henderson  
 Paper fabric.....J. Arkell  
 Parachute.....C. W. Van Vleet  
 Pen. Fountain.....J. H. Crowell  
 Photographic developing apparatus.....G. J. Stage  
 Photographic shutter.....J. E. Thornton  
 Photographic shutter air check.....G. F. Fraley  
 Photographic shutters. Pneumatic apparatus for controlling duration of exposure in.....J. E. Thornton  
 Photographs, engravings, or the like. Mounting.....E. H. & A. E. Derapas  
 Piano agraffe attachment.....H. Sohmer  
 Picture apparatus. Moving.....H. N. Marvin et al  
 Picture exhibitor.....J. Q. Adams  
 Pigment. Apparatus for manufacturing white.....J. B. Hannay  
 Pipe wrench.....J. Donaldson  
 Pipe wrench. Ratchet.....J. Levy  
 Pipes. Manufacture of.....J. K. Smith  
 Plane. Block.....J. P. Vance  
 Planter and marker.....H. L. Johnson  
 Planter. Corn.....J. L. Cox  
 Planter. Rotary drop corn.....R. Armstrong et al  
 Planter. Seed.....A. B. Kepner  
 Pliers. Self feeding stapling.....B. Gastaldi  
 Plow attachment.....O. Meister  
 Plumb or level.....C. C. Hummel  
 Pneumatic despatch apparatus.....F. R. Taisey  
 Pneumatic elevator for cotton.....J. W. Hicks  
 Poke. Animal.....W. S. Brown  
 Poke. Animal.....A. Krantz  
 Powder rods. Machine for making insulations in.....E. Gathmann  
 Power appliance.....L. B. Holliday  
 Power factor meter.....O. Holtz  
 Power transmission.....H. W. Buck  
 Power transmitting device.....O. F. Persson  
 Pressing machine. Tailor's.....J. Langton  
 Printer's furniture.....J. C. Bovard  
 Printing machine.....M. Rosenfeld  
 Printing machine. Stencil.....A. B. Dick  
 Printing press.....L. B. Martin  
 Printing press feeding mechanism.....C. H. Palmer et al  
 Printing press picking attachment.....G. W. & W. W. Read  
 Printing press. Platen.....W. M. Rockstroh  
 Printing presses. Means for feeding bags, &c. to.....C. H. Palmer et al  
 Propeller.....E. S. Jacobs  
 Propeller wheel.....J. W. Nowak  
 Pulley block.....J. L. de Vou  
 Pulp or paper stock screen.....O. H. Moore  
 Pump.....W. A. Kerfoot  
 Pump.....P. Thomas et al  
 Pump.....K. S. Geiger  
 Pump. Air.....H. Turner  
 Pumps. Bottom wheel for bucket or conveyer.....L. A. Brigel  
 Puzzle.....C. L. Smith  
 Puzzle.....R. C. Hill  
 Pyrotechnics. Preparing.....N. Del Grande  
 Rail joint.....D. P. Monroe

Rail joint.....W. J. McCoy  
 Railway brake.....L. R. Battle  
 Railway contact device. Electric.....E. M. Hewlett  
 Railway. Electric.....A. N. Connett  
 Railway. Electric.....J. S. Pevear  
 Railway. Electric.....G. T. & L. Woods  
 Railway signal.....M. D. Hanlon  
 Railway splice bar.....I. O. McClaskey  
 Railway system. Third rail electric.....G. Bertram  
 Railway system. Surface contact.....W. B. Potter  
 Railway tie cutting machine.....A. W. Barrs  
 Railway track structure.....2 pats.....G. M. Frvin  
 Railway track structure.....5 pats.....A. L. George  
 Railway track structure.....J. Hart  
 Railway track structure.....3 pats.....G. H. Parmelee  
 Railways. Plow raising means for conduit.....A. N. Connett  
 Rake attachment.....E. L. Wick  
 Ratchet cylinder wrench. Roller.....W. H. George  
 Razor.....H. H. Mintzer  
 Refrigerating or like machines. Absorber for ammonia absorption.....A. Qsenbruck  
 Register.....A. R. Beal  
 Retort charging apparatus.....L. Bertrand  
 Revolver.....A. Fyrborg  
 Rheostat.....C. J. Reed  
 Riveting machine.....P. F. King  
 Rolling plates or sheets. Apparatus for.....C. W. Bray  
 Rotary engine.....M. Cameron  
 Rotary engine.....F. A. Palle  
 Sap spout.....G. H. Grimm  
 Sap spout.....A. B. Kilpatrick  
 Saw filing machine.....J. W. Foley  
 Saw guide. Band.....W. Miller  
 Saw patch. Band.....F. L. Gausden  
 Saw set.....C. Morrill  
 Saw tightener.....A. H. South et al  
 Sawing machine.....J. T. Marsh  
 Sawing machine. Draw cut.....S. Field  
 Sawing machine. Portable wood.....F. T. Palmer  
 Scales. Mounting for spring adjusting rods of weighing.....F. Mulligan  
 Scales. Quick weighing attachment for.....M. Maurer  
 Screw driver.....L. S. Sierrett  
 Scythe snath bending machine.....G. M. Fenn  
 Sewing machine lap seam felling attachment.....S. P. Brown  
 Sawing machine needle guide attachment.....C. C. Cherry  
 Sewing machine stop mechanism.....D. Mills  
 Shade stop. Window.....G. M. Rust et al  
 Shaft. Extensible.....J. Lehman  
 Shaft support. Vehicle.....T. H. Bennett  
 Shaving mug.....W. G. Rivers  
 Shearing machine. Hydraulic.....G. W. Shem  
 Snips' running lights. Telltale for.....J. L. Hall  
 Shoe.....H. Fischer  
 Shoe.....C. F. Klein  
 Shoe.....W. Lanz  
 Shoe holding device.....A. J. Skinner  
 Shoe tongue fastener.....M. B. Morse  
 Shoe upper fastener.....W. E. Ellis  
 Shuttle. Self threading.....J. Daudelin  
 Sign. Changeable.....J. W. Currier  
 Skirt holder. Adjustable.....J. L. Nicholson  
 Sled.....H. G. M. Howard  
 Sliding jaw wrench.....O. Gebauer  
 Smoke consuming furnace and damper regulator therefor.....F. A. Kirby  
 Snow plow.....P. B. Blazel  
 Soldering machine.....J. Black et al  
 Sole. Metal shoe.....E. G. Lutz  
 Sound reproducing records. Making.....F. W. H. Clay  
 Spectacle or eyeglass mounting.....L. Fox  
 Spectacles.....J. C. Wells  
 Speed mechanism. Variable.....A. A. De Loach  
 Spike or nail puller.....J. H. Duncan  
 Spindles. Means for connection spools or bobbins to.....F. J. Rabbeth  
 Spinning spindle.....A. E. Rhoades  
 Spinning stop motion.....W. G. Morrison  
 Spraying device.....J. W. Flow  
 Spring frame.....F. A. Hall, Jr.  
 Sprinkler head.....P. Evans  
 Stamp mill.....J. A. & J. W. Shields  
 Stamp stem guide. Battery.....J. H. Hendy  
 Steam boiler.....J. M. Bradley  
 Steam boiler for locomotives or other machines.....W. N. Best  
 Steam boiler. Water tube.....H. See  
 Steam engine.....W. Sutcliffe  
 Steam engine and pressure accumulator therefor. Compensating.....W. C. Brown  
 Steam generator.....J. H. Peelen  
 Steam meter.....C. E. Sargent  
 Steam trap.....F. D. Koehler et al  
 Steam trap.....W. H. Powell  
 Stereopticon.....J. A. Seaverns  
 Still.....E. Huber  
 Storage battery.....R. Darling  
 Stove. Downdraft.....W. F. Wolfe  
 Stoves. Gas burning attachment for coal cooking.....H. C. Steinhoff  
 Strainer belt.....C. Edgerton  
 Surgical applicator.....E. L. Ridgway et al  
 Swift bracket.....W. G. Morrison  
 Swingletree clasp.....O. Lorenz  
 Switch casing. Moisture proof.....E. L. Etheridge  
 Switch control mechanism.....P. L. Clark  
 Swithes. Mechanism for operating snap or rotary.....W. A. Harvey  
 Syringe. Hypodermic.....C. J. Tagliabue et al  
 Table or stand.....L. B. & T. Sidway  
 Tandem compound engine.....S. M. Vaclain  
 Tap. Beer keg.....G. M. Eckenwiler  
 Taps. Construction of high pressure water.....W. Bradley  
 Telegraphy.....H. A. Rowland  
 Telegraphy. Wireless.....J. F. King  
 Telephone lock.....W. H. Scott  
 Telephone receiver holder.....A. J. Briggs  
 Telephone system signal device.....E. P. Baird  
 Telephone toll slot machine.....W. S. Paca  
 Thermo electric generator.....A. Tissier  
 Tile flooring.....C. P. Capen  
 Tile forming apparatus.....J. Sherry  
 Tire. Compressible vehicle.....H. P. Feister  
 Tire valve coupling. Pneumatic.....A. B. Catterall  
 Tire. Wheel.....F. H. Chase  
 Tire. Wheel.....J. P. Donovan  
 Tobacco. Improving.....C. Reimann

Tobacco. Treating.....J. H. Fendrich  
 Tone modifier.....L. C. Smith  
 Tongs operating mechanism.....H. Alken  
 Tongs. Tubing.....W. H. Downing  
 Tongue support. Vehicle.....B. C. Cowden  
 Tool holding device.....W. B. Fowler  
 Tool stock.....J. G. Jernberg  
 Torch. Engineer's.....A. K. Young  
 Toy.....F. Carter  
 Toy.....B. B. Whaley  
 Toy.....D. J. Wilson  
 Toy cannon.....E. N. Tuttle  
 Toy wheel.....J. C. Wells  
 Train stopper.....J. B. Sheppard et al  
 Transformers. Varying the output of.....J. S. Peck  
 Transmitter arm.....W. Kaisting  
 Tray. Extension.....W. Maxwell  
 Trees. Device for bending and shaping growing.....L. Ecker  
 Tripod.....W. C. Dickerson  
 Tripod head. Photographic instrument.....F. A. Robbins  
 Trolley.....F. Lehrmann  
 Trolley wheel.....W. E. Ryer  
 Trolley wheel and holder.....F. D. Moon  
 Trolley wheel bearing.....G. E. Chapman  
 Trolling hook.....A. H. Smith  
 Truck.....J. C. Moore  
 Truck bolster. Car.....E. Cliff  
 Truck frame railway cars. Swing motion for.....J. M. Hansen  
 Trunk. Bureau or dresser.....A. W. Moede  
 Truss. Hernial.....C. R. Turner  
 Tug reinforcement. Harness.....D. W. Hawkins  
 Turbine motor.....J. E. Sheriff  
 Turbine. Steam.....C. A. Parsons  
 Type writing machine tabulating device.....F. X. Wagner  
 Vaccine shield.....A. B. Dorman  
 Valve.....W. G. Wilson  
 Valve. Engineer's brake.....M. Corrington  
 Valve. Equalizing discharge brake.....G. H. Fraser et al  
 Valve. Gate.....S. S. Jacobsen  
 Valve gear.....J. T. Fenton  
 Valve gear. Cut off.....J. F. Van Tuyl  
 Valve. Steam engine.....P. B. Belches  
 Vaporizer.....J. H. Valentine

Vault. Burial.....G. Bolser  
 Vehicle.....J. Cummings  
 Vehicle brake.....W. M. Mason  
 Vehicle driving mechanism.....P. Synnestvedt  
 Vehicle jack.....H. P. F. Reppenbagen  
 Vehicle life guard.....A. Hardy et al  
 Vehicle running gear.....H. B. Atkins  
 Vehicle wheel.....W. Morrison  
 Vinegar generators. Automatic feeder for.....H. Frings, Jr  
 Vise.....E. H. Byer  
 Volt ampere meter.....M. C. Rypinski et al  
 Wagon brake. Automatic.....C. Garver  
 Waistband.....M. Koppelman  
 Washing apparatus.....W. Forger  
 Washing machine.....N. G. Nunn  
 Washing machine.....L. Marks  
 Waste and overflow fixture.....L. Kosiol  
 Water closet and apparatus connection.....G. F. Ryan  
 Water purifier.....G. M. Davidson  
 Water softening apparatus.....W. Body  
 Water tube boiler.....G. J. d'Almeida et al  
 Weaner. Calif.....A. T. Keech  
 Weighing tea, &c. Apparatus for.....J. P. & G. M. Stubbs  
 Welding compound.....M. P. Shafer  
 Wheel.....W. H. Hendricks  
 Wheel fender.....D. Boothe  
 Winding machine stop motion.....T. H. Rushton  
 Window corner post, transom bar, or mullion.....P. Ebner  
 Window jamb pockets. Tool for cutting.....F. H. Borden  
 Window or other frames. Means for securing glass in.....E. Fabry  
 Window screen.....H. Lange  
 Window screen. Adjustable.....B. C. Rockwell  
 Wire holder.....C. L. Packer  
 Wood. Obtaining impregnated.....G. F. Lebioda  
 Wood washing apparatus. Raw A. Haas et al  
 Woven fabric.....C. H. L. Hanson  
 Wrapping machine.....O. Tyberg  
 Wrench.....C. S. Bonney  
 Wrench.....M. J. Fitzgerald  
 Wrench.....G. McKercher  
 Y-ray tube.....J. O. Heinze, Jr  
 DESIGNS.  
 Rug.....6 pats.....E. T. Brundage

## BOYS Get a Good Stem Winding Watch FREE

You get 10 subscribers to a \$1.00 paper for 6 months at only 20 cts. each. You send us the 10 names and addresses and \$2.00 and get the watch. Perfect time guaranteed for 1 year. Full outfit free.

Address,

AMERICAN HORSE-POWER.  
 315 Dearborn Street, Chicago.

## ...SILK...

A JOURNAL PUBLISHED MONTHLY.  
 Devoted exclusively to the Raising of SILK and the Manufacture of the same. Only one dollar (\$1.00) a year.

Subscribe now. It contains information you ought to know.

Address,

SILK PUBLISHING COMPANY.  
 Tallulah Falls, Georgia.

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

Foreign patents may also be obtained in certain other countries.

The Manhattan  
 Typewriter,  
 Guaranteed to be of the  
 Highest Grade.  
 NOT IN THE TRUST.  
 PRICE \$50.  
 JOHN C. PARKER,  
 619 Seventh St. N.W., Washington, D. C.

## Attention Inventors!

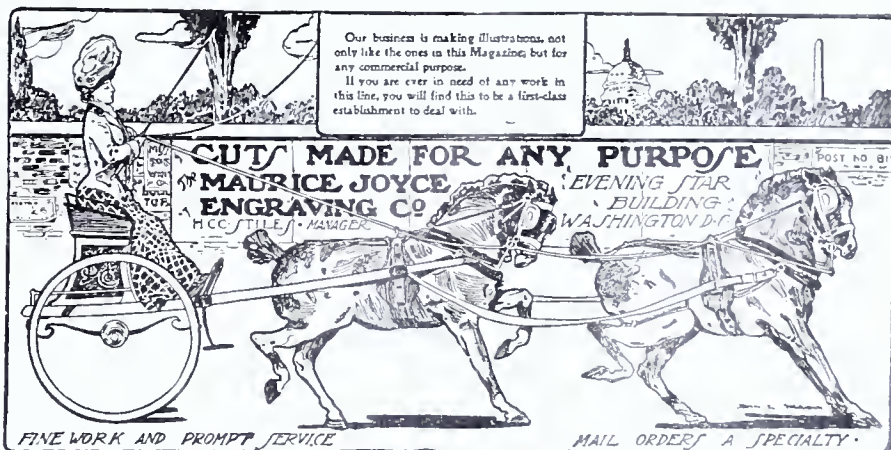
LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

Charge one dollar.

In ordering, please state specifically the class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.





AN ELEGANT REPRODUCTION OF A CHARMING

# \$75,000.00 Painting

Given Away



REDUCED ILLUSTRATION

"THE VILLAGE WEDDING"

FULL SIZE 25 BY 38 INCHES

FOR several years the publishers of the WOMAN'S HOME COMPANION have been searching for something, to give to their subscribers, that would ECLIPSE ANYTHING EVER OFFERED BY ANY PUBLISHING-HOUSE IN THE WORLD. At last, at great expense, they are able to make it possible for every home in America to possess a magnificent and faithful reproduction of one of the most remarkable paintings ever produced by mortal man in this or any other age. It secured for the artist the honor of immediate admission to the ranks of the Royal Academy. The original painting was shown all over Europe, and thousands upon thousands of people gazed upon it with rapture. It was quickly bought up for \$75,000.00, and placed in the position of honor in one of the most celebrated galleries in Europe, and no American money yet offered has been able to secure it for this country. The whole picture fascinates one with its absolute accuracy to life. Every figure in itself alone is a study that would make a wonderful picture. Every face is alive with the spirit of action. It is a picture of mirth and merriment; a picture to bring sunshine into every home and the heart of every one who gazes upon it. You cannot tell our engraving from the only other authorized reproduction, which sells in Europe for \$18.00 (eighteen dollars). Our exquisite reproduction is 25 by 38 inches, including margin, the exact size of the costly European engraving, and will be a splendid addition to the art collection of any home, whether framed or hung without framing, a fashion now so much in vogue.

**WOMAN'S HOME COMPANION** This magazine is edited and made up in the city of New York, the leading literary and art center of America. It contains the most timely illustrated articles, the most beautiful illustrations, the best short stories, the most popular serial stories, the most practical household departments, the best of everything desirable for a home magazine. It is printed on the finest paper, has 44 to 60 large pages, 11 by 16 inches. The twelve numbers will contain more than one thousand beautiful illustrations. Each month it carries a message of help, profit, pleasure, education, culture and refinement to over two million readers. Its editors and contributors are the most popular American writers. It is altogether the cleanest, brightest, handsomest, choicest and best of American home magazines.

**\$7.00 for \$1.85**

"THE VILLAGE WEDDING,"	very, very cheap at \$5.00
WOMAN'S HOME COMPANION	one year, price 1.00
INVENTIVE AGE & PATENT	one year, price 1.00
= = INDEX = =	

A total  
value of  
**\$7.00**

**BOTH PAPERS ONE YEAR AND THIS PICTURE SENT  
TO ANY ADDRESS**

For  
Only **\$1.85**

In this offer, although paying less than the ordinary and regular price of the papers for a year, you get in addition the above-described charming picture ENTIRELY FREE.

The papers and picture in the above offer can go to different addresses.

THE ABOVE OFFER APPLIES TO OLD OR NEW SUBSCRIPTIONS.

SEND ALL ORDERS TO

**INVENTIVE AGE PUBLISHING COMPANY.**  
WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

# THE Inventive Age

AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 7.

WASHINGTON, D. C.---JULY, 1903.

SINGLE COPIES 10 CENTS  
ONE DOLLAR A YEAR.

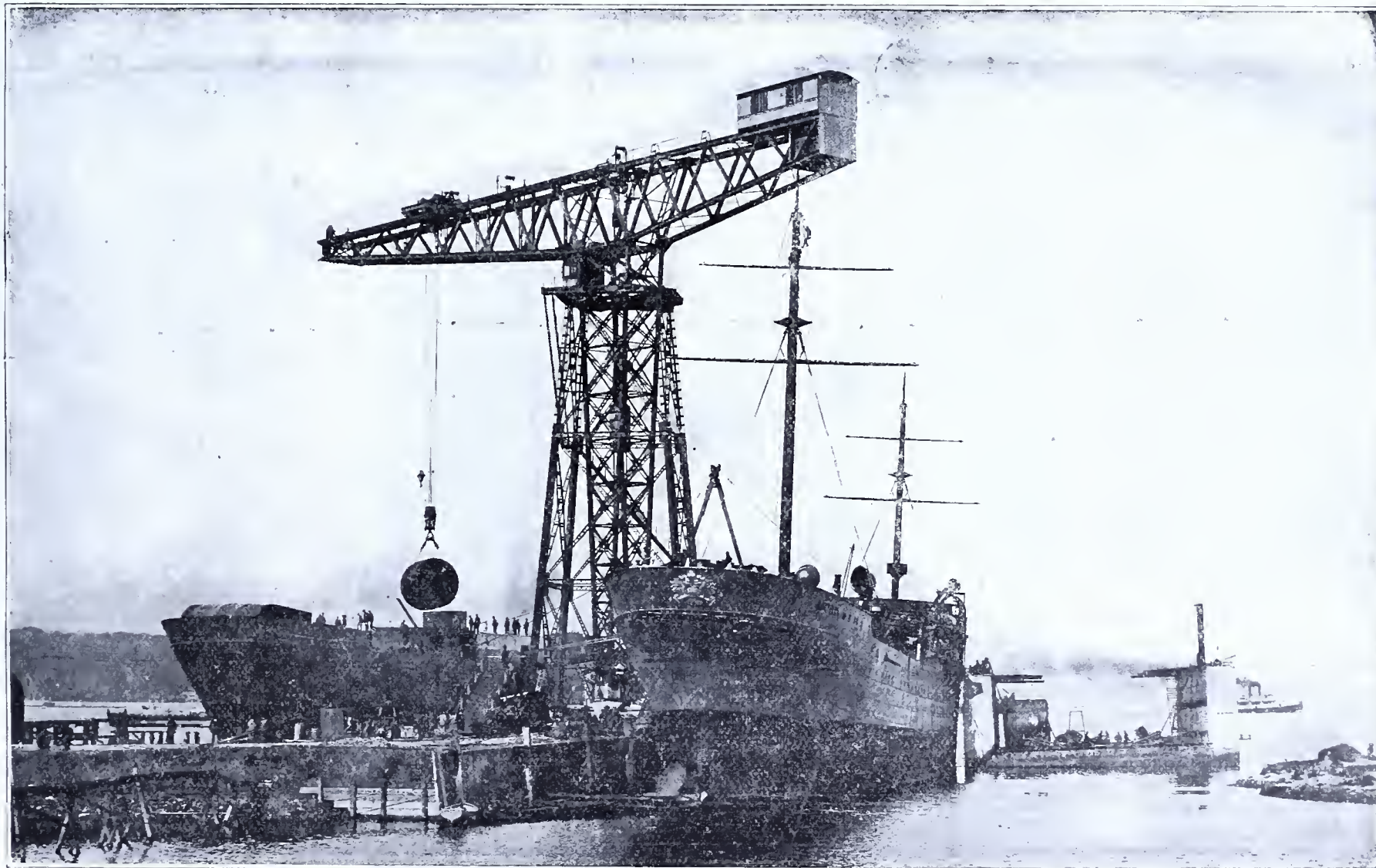
- - LARGEST ELECTRIC CRANE IN THE WORLD. - -

ELECTRIC CRANES have become indispensable in shipbuilding and in the transport of heavy merchandise. A few years ago, hand cranes were in use in German shipyards and on the harbor docks. These were soon superseded by steam cranes, and to-day electric cranes are not only in use on shore, but all the large German passenger steamers are likewise fitted up with them.

In order to move great masses of armor plate, heavy machinery, boilers, and smokestacks from the docks on shipboard, it became necessary to build

Company, near Dusseldorf, and the electric outfit by the Union Electrical Company, in Berlin.

The harbor of Kiel is the most important naval harbor in Germany, and is the station of the German Baltic fleet. Our readers will recall the fact that it was at that place our European squadron recently visited, on the occasion of which visit the German Emperor sent his dispatch to President Roosevelt, telling about his inspection of the battleship Kearsarge.



cranes of enormous size and strength. The largest crane of this class in the world is now in use in the harbor of Kiel, Germany. It is so arranged that two of largest vessels afloat may steam up on either side of it (see illustration) for the purpose of unloading or exchanging cargoes. The crane is powerful enough to lift 150 tons at one time. In the illustration the crane is shown in the act of lifting a heavy load from one of the vessels. The machinery is set in motion by electricity. It was built by the firm of Gebruder Howalt, in Kiel, Germany. The iron construction was furnished by the Benrather Machine

The port of Kiel and its approaches are very strongly fortified. The excellence and safety of the Kiel harbor, whose only drawback is that it is frozen in winter, have made the town one of the principal ports of the Baltic. It possesses a sea-bathing establishment, and is surrounded by fine scenery.

There is another crane in use in Germany which is called the floating crane. It is built on a large, massive flatboat, and is easily moved from place to place at will. It is used principally in the construction of dry docks.



## HYDRAULIC CANAL LOCK.

THE hydraulic lift lock now nearly completed on the Trent Valley Canal, a few miles north of Peterborough, Ontario, Canada, on the Otonabee River, is said to be the largest lock of its kind in the world. The accompanying illustration gives a pretty fair idea of its general construction.

There are two water-tight steel boxes or chambers, 33 feet in width by

other down, both gates toward the reach open ready for the vessel to enter. When the chambers are thus, the bottom of the upper chamber will be about 10 inches lower than the bottom of the canal above, and has, say, 8 feet 10 inches of water on the sill. The bottom of the lower chamber will be just level with the bottom of the canal below, and will have 8 feet

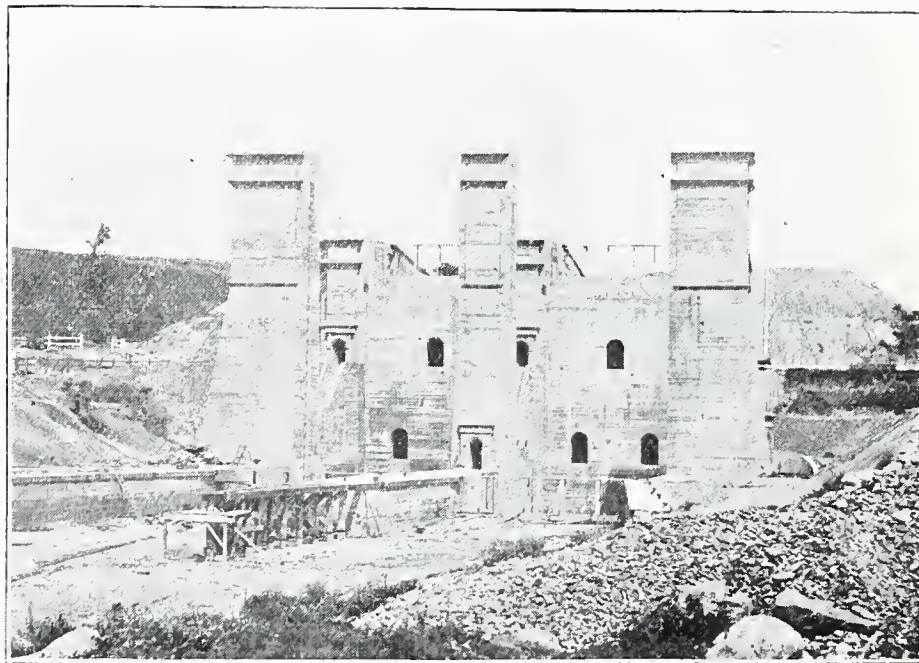


140 feet in length, with 8 feet of water in the clear, and closed at the ends by means of gates hung on the lower edge.

Similar gates also close the ends of the reaches. These chambers are carried by means of heavy trusses supported on top of two rams, 7 feet 6 inches in diameter, which work in two steel water-tight presses, one under each chamber. The presses are connected with each other by a pipe 12 inches in diameter, in the center of which a valve is placed for the purpose of regulating the motion of the chambers. For the purpose of making up for the small quantity of water lost in the working of the main presses, an accumulator is installed in one of the side towers. This accumulator has a ram 20 inches in diameter, with a stroke of 30 feet 6 inches, working at a pressure slightly greater than that of the main presses. Its pressure is also used to operate the gates, capstans, and small pumps. The junction between the ends of the movable superstructure and the ends of the reaches, is made water-tight by means of a continuous rubber hose placed on the outer sides of the ends and bottom of the gate of the reach. This hose is inflated with compressed air from a Taylor air compressor installed in the main wall.

The mode of operating the lock is as follows: Supposing both chambers are at a standstill, one up and the

other down, both gates toward the reach open ready for the vessel to enter. When the chambers are thus, the bottom of the upper chamber will be about 10 inches lower than the bottom of the canal above, and has, say, 8 feet 10 inches of water on the sill. Thus, the upper chamber has 10 inches more water in it than the lower chamber, and consequently is so much heavier than the lower one (approximately 100 tons.)



The valve in the connecting pipe between the two presses is closed. When it is desired to operate the lock gates at the end of each chamber, and the gates at the ends of the reaches are closed, the air is allowed to escape from the air hose—making the water-tight seal between the lock and the end of the reach—and the operator, who stands in his cabin on the top of the central tower, opens the valve in the

connecting pipe between the presses. The upper chamber then commences to descend and the lower chamber to ascend till both chambers reach their new positions, the upper chamber being now level with the lower reach and the former lower chamber being opposite the upper reach. The operator now closes the main valve in the connecting pipe and inflates the air hose forming the water-tight seal at the end of the lock. When the chambers are in their new positions, the surface of the water in the lower chamber is 10 inches above the surface of the water in the reach below, and the surface of the water in the upper chamber 10 inches below the surface of the water in the reach above.

Communication between the water in the chambers and the reaches is now made by opening the valves in the gates nearest the reaches, and the water in each chamber is allowed to find its own level. The gates are then opened. When this is done the chambers are in the condition they were on starting. Vessels are hauled in and out of the chambers by means of hydraulic capstans. The time allowed to lock and pass one or two vessels in and out of the lock will be from twelve to fifteen minutes. The time required to raise or lower the lock chambers will be about three minutes. On the upstream side of the lock, a guard gate will be placed which will be operated by hydraulic power and will be closed when a vessel enters the lock. The substructure of the hydraulic lock is built of concrete. The natural surface of the limestone is at such an elevation that very little expense is necessary

for the finishing of the floors at the lower-reach level. The main retaining wall—126 feet long by 40 feet thick—rests upon the limestone formation. Its height will be about 83 feet. The sides are carried up plumb for their whole height, the bearing pressure upon the lock being only about 6 tons per square foot. The steel superstructure is being built by the Dominion Bridge Company, of Montreal.

## VACUUM HOUSE CLEANING DEVICE.

A new system of cleaning was recently to be seen in operation at the Crystal Palace International Exhibition, London. The exhibitors were the Vacuum Cleaner Company, Ltd., 106 York Road, Lambeth, London, S. E. The principle adopted should be of special interest, inasmuch, as it is an important economizer of labor, to say nothing of its advantages in rendering house cleaning possible without creating dust, removing carpets, curtains, furniture, bedding, &c. The process is based upon Booth's patents embodied in a machine which can be sent from house to house. This is provided with a pair of vacuum pumps actuated



Fig. 1.

by any small motor which serves to maintain an exhaust of several pounds to the square inch. At one end of the machine is a filter or dust receptacle supported on brackets, which receptacle is a tightly closed vessel with a capacity of a peck or more. From the filter extends a length of hose, a portion of which is seen in (fig. 2.) The hose may be of any length up to one hundred feet, and terminates in a cleaner or renovator, formed of tubes flattened out at the end. This renovator is rubbed up and down the carpet or the cloth of upholstered furniture, and rapidly sucks from them all the dust which may be upon the surface, or embedded in their interstices, the underfelt being thus cleaned. In this way dust from the whole of the carpet is rapidly removed without the slightest appearance of dust. Not a particle of dust can be detected if the carpet is then beaten. Indeed, in an experiment made in London with a carpet returned as clean from a power beater, a considerable amount of dust was extracted by the vacuum process. The severe test of sprinkling a carpet with flour and thoroughly rubbing it in has been made, the vacuum cleaner removing every particle of the flour.

The system can be applied to all kinds of upholstered furniture, curtains, clothing, bedding, &c., the dust being drawn into a closed receptacle, to the great advantage of the public generally, inasmuch as germs and microbes cannot be scattered about, is sucked through the hose into the filter, whence it is removed and hygienically disposed of—analysis showing that it is composed of many deleterious substances. The pile and color of the carpet are restored by this



process, and it is claimed that there is no injurious effect whatever.

In a similar way, walls may be cleaned of dust, the cleaner being a brush of horseshoe shape, with an exhaust tube in the center.

Our illustrations show (fig. 1) one of the company's operators at work in a large London hotel, and (fig. 2) a view of one of the electrically-driven portable plants, the dimensions of which are only 3 ft. 6 in. by 4 ft. high and 2 ft. 8 in. wide, and can therefore be easily moved in elevators from floor to floor. Petroleum motor plants are supplied where electricity is not available.

In hotels, theaters, large business houses, and the like, it is proposed to install permanent stationary plants, so that cleaning can take place daily, thus practically abolishing sweeping. Such a plant would be in the basement, with an iron pipe of small diameter leading to fixed points on each floor. At these points flexible hose would be attached, and the plant would be operated, collecting the dust in the basement. No skilled operators are required. Railroad and street cars, vehicles, and ships' cabins and saloons could all be cleaned daily by stationary plants.

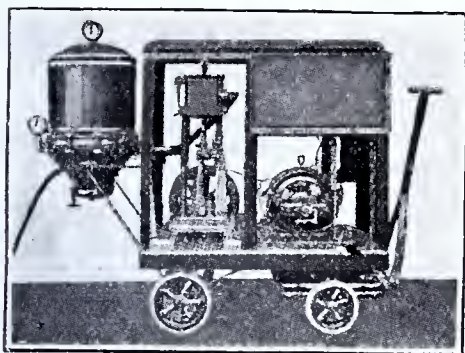


Fig. 2.

To clean residences, the portable machine can be placed in the yard or street and the hose extended into the different rooms. It is stated that the carpets, tapestry, upholstered furniture, mattresses, and bed clothing can all be cleaned of dust in a day, one man cleaning six or eight rooms. There are half a dozen different renovators attachable to the hose, adapted for carpets, chairs, walls, or bedding, as the case may be.

The sanitary feature of this mode of cleaning, in that it removes dust from the house and destroys it, is dwelt upon. The London Lancet considers the invention of sufficient importance to particularly describe and approve it.

The machines and apparatus are at present only leased and in no case sold by the cleaner company.

#### Glass Pavement.

A new pavement, whose chief component is glass, has been recently tried in Paris and given satisfactory results. A special glass is employed in this preparation, which, after being pulverized and suitably mixed with the other substances, is submitted to the action of heat, under great pressure, to the point of fusion. It is then molded into small square tiles or paving stones, which without having the fragility of glass, retain resistance to atmospheric agencies. This composition is called glass stone or Garchey Stone.

### ELECTRIC TRAMWAY BUILT ON ICE.

THE capital of the Russian Empire covers an area of over twenty-one thousand acres, of which twelve thousand belong to the delta proper of the Neva; while over thirteen thousand acres are under water. The Neva, which leaves Lake Ladoga at its southeast angle, flows in a wide and deep stream for 36 miles southwest and northwest, describing a curve to the south. Before entering the Gulf of Finland, it takes for two and one-half miles a northerly direction: then it suddenly turns and flows southwest and west, forming a peninsula on which the main part of St. Petersburg

cation are insufficient, in view of the traffic and the immense area of St. Petersburg, and in the summer season an extraordinary number of canoes and steamboats traverse the canals and especially the Neva and its branches.

When winter comes, as it does so early in the north, (navigation being closed from the months of November to April), the Neva is covered with ice from two to three feet thick, and the bridges of boats are withdrawn, and there are substituted bridges of wood or temporary roadways mounted upon the ice and destined exclusively for



stands, the river subdividing into several branches. The chief branch is the Great Neva, and the other branches are the Little Neva, the Great Nevka, the Little Nevka, the Middle Nevka and the Karporka. As a result, St. Petersburg is divided into numerous islands by the branches of the Neva and the many canals which cross it: communication being maintained by means of over one hundred and fifty bridges. The majority of the bridges are boats and floating bridges, but there are some of stone and iron and of modern construction, which are a credit to the Muscovite art. The latter are named the Nicholas and the Alexander. These means of communi-

the use of pedestrians and carriages. They are lighted artificially. As soon as the ice permits, two electric tramways are installed over the Neva. One goes from the left shore to the island of Petrowsky: the other starts from the English quay opposite the Senate house, and terminates in the island of Bailio, near the Academy of Fine Arts. On both lines the electric current is carried by trolley, the wooden posts which support the conducting wires being solidly imbedded in the ice.

The illustration shows one of these bridges and an electric tramway, the rails being laid on top of the ice, while at the side is a foot passageway for pedestrians.

#### Diamond Cutting.

A new method of cutting diamonds, which is called the "twentieth century cutting" has awakened interest among lovers of gems. It is said that this new process will even revolutionize the diamond trade, as it increases the brilliancy of the stones fully 100 per cent. makes them appear much larger, and also renders them equally brilliant, from whatever point they are regarded.

The proper preparation of diamonds involves much more than a mere knowledge of the cutting of precious stones. One must be an expert in the laws of optics, must be thoroughly acquainted with properties of diamonds, must be able to devise such formations that each facet shall have the more suitable relation to the other facets, and must have the technical information necessary to carry out the design. The work is, naturally, extremely expensive. A model is first executed in glass—in itself a difficult and delicate undertaking—and then the design is tried on an actual diamond. In order to make the proper tests, only large stones can be used for this work, and many of those which were employed merely for experimental purposes cost as much as \$1,000 each.

The three standard methods of cutting diamonds, in common use before the discovery of this new process, are known as the "rose cutting," and "cushion cutting," and the "brilliant cutting," and are familiar even to laymen. The rose cutting is the oldest, and is still employed for small stones: the diamond has, when finished, a rounded appearance, and has no regular number of facets. The brilliant cutting has 58 facets; the new cutting gives the stone eighty facets, and the stone comes to a point at top and bottom, dispensing with the flat surface formerly seen at these spots, and thereby with the lusterless and full effect produced by the top view of a diamond. It is well known fact that to get the best result from a diamond, one must turn it until the light strikes it at the proper angle. By the "twentieth century cutting," the light is reflected from the entire upper surface, as well as from the sides, with marvelous brilliancy, no matter from what angle it comes.

#### New Insulator.

A Danish engineer has invented an improved insulating material, for boilers, steam pipes, as well as for electrical insulating purposes. The new substance is made principally from cork dust or cork waste, peat dust or small peat, or the like, mixed with water glass, or silicate of potash, and subjected to a hardening treatment. Besides being a good insulator, the improved material has the advantage of being incombustible and insoluble in hot or cold water, or steam. In the manufacture of this material, the inventor takes cork dust, cork waste, peat dust, small peat, or some similar material, and saturates it with water glass. The resulting compound is poured into molds and boiled in a solution of chloride of calcium, chloride of magnesia or other chloride salt. This has the effect of hardening the mass, and the resultant compound is washed or rinsed in water, to remove any chloride of soda which may be produced during the hardening operation.

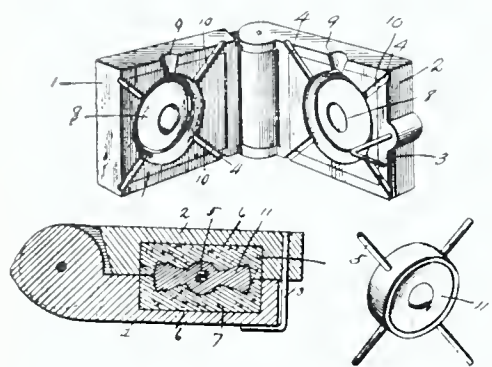


## CLEVER NEW PATENTS.

Forming Joints for Wires.—Elevators.—  
Land Rollers.—Door Closer and Fan.

### Forming Joints for Wires.

An important improvement in the method of forming joints for intersecting wires and rods has been patented by Messrs. John C. and Willie J. Pope, of Plano, Illinois, who are well-known inventors in the fence line. The invention is particularly applicable for forming joints in intersecting wires or rods of fences, gates, and the like. In carrying the invention into effect, a two-part mold is employed comprising two members 1 and 2, suit-



ably connected, as by a pivot, one of the members carrying a revoluble clamp or catch 3, to engage the other member to hold the parts closed and firmly secured upon the intersecting wires to be joined. The opposed faces of the flask members are provided at their corners with diagonally disposed grooves 4, adapted, when the members are closed, to register and to be engaged by the wires or rods 5 to be united. Each fastening member is provided with a cavity 6, in this instance shown rectangular, in which are placed the chill members 7, the opposed faces of which lie flush with those of the flask-sections and are provided with depressions 8, bearing the design of the rosette or joint to be cast round the intersecting wires 5. The chill, as usual, is made of metal and operates in the well-known manner to quickly cool the molten metal employed for the joint, thereby rendering it unnecessary to leave the flask positioned upon the wires for any length of time, whereby the formation of the joints will be facilitated. Each flask-section and each chill-section is provided with a gate 9, through which the molten metal enters the chill and encloses the intersecting wires. The chill-sections are also provided with diagonally disposed grooves 10, which align with those of the flask members, and thereby operate to firmly hold the flask associated with the wires.

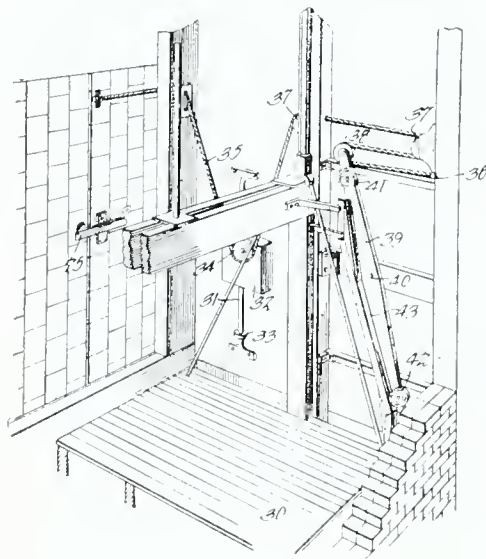
The manner of carrying the method into effect is as follows. The flask being clamped around the intersecting wires or rods, molten metal is poured into the gate and enters the chill, enclosing the intersecting portions of the wires by a button or rosette 11, of any desired exterior ornamentation. As

soon as the molten metal contacts with the faces of the chill, it is immediately cooled, and the flask may then be removed, dipped in water, if necessary, and then positioned on other intersecting wires.

The advantage arising from the employment of a flask provided with a chill in the manufacture of fences, gates, and the like is that the formation of the joints is facilitated, and time saved in the procedure. Of course it will be understood that a number of these chill-carrying flasks may be provided, so that as soon as one has been used and removed, it may be laid aside and allowed to cool while another is employed.

### Elevators.

Automatically operating mechanism for opening and closing gates or doors of elevator hatchways has been devised by Mr. John E. W. Fogal, of Quincy, Illinois, and a one-half interest in the patent obtained thereon has been assigned to Mr. Henry B. Dines, of the same place. The principal object of the invention is to provide mechanism which is so arranged as to permit the car or platform to pass and repass any number of floors without opening any of the doors, yet may be automatically adjusted to operative position as the car approaches a floor, so that the doors will open if released by the operator. The accom-

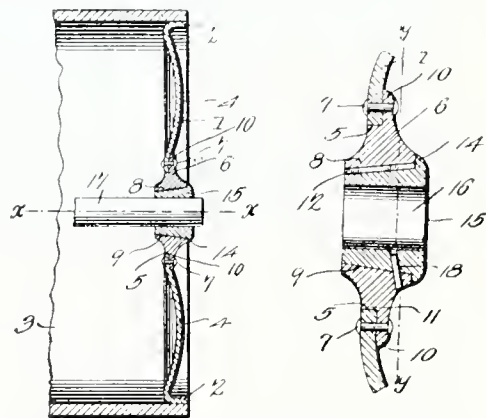


panying illustration is a perspective view of the interior of an elevator shaft, illustrating the mechanism employed. While the apparatus may be used in connection with gates or doors of any size, it is intended principally for use in connection with fire doors, which are ordinarily formed of fire proof material and of such weight as to prevent the operator from opening and closing the same without the exercise of considerable power. In the present case, the doors are normally held closed by a weight (not shown) and are also arranged to be opened by a weight 32 which weight is heavier than the closing weight, but is normally inoperative. This weight 32 slides upon a suitable guide 31, and a cable secured to the door passes around a pulley mounted on the weight and another pulley secured to one end of a lever that is pivotally mounted between its ends in the shaft.

This lever carries at its ends bearing rollers 41 and 42 arranged to be engaged by an inclined bar 43 attached to the car. Under normal conditions the weight 32 is resting upon a stop 33 on the lower end of the guide rod 31 so that it is inoperative, but as the car approaches the floor, the lower wheel 42 of the lever will engage the inclined track 43, so that said lever will be swung on its pivot. The movement of the upper end of the lever will draw upwardly upon the cable, so that the weight will be raised. If now the operator stops at the floor, it is only necessary for him to unlatch the doors 25, whereupon the weight 32, overcoming the closing weight, will open the doors. As the elevator is again started, the lever 39 will swing back to its original position as soon as disengaged from the car. The opening weight, therefore, drops and permits the closing weight to move the door to closed position.

### Land Roller.

Open-ended land-rollers, as they are oftentimes constructed, are objectionable on account of the liability of stones and obstructive matter gathering within the same and subsequently thrown out to the discomfort and oftentimes danger of the operator. The obvious remedy has been to construct the rollers with closed ends or heads, and many varieties of such are now in use, as is well known. One difficulty with the rollers having closed ends or heads has been the liability of the bearings to wear out, such bearings having been oftentimes formed integrally with the head, in which event it has been necessary to detach the entire heads for repairs. Separate bearings have been provided; but these have either been riveted to the head, which event it has been necessary to detach the head for the renewal of the bearings, or when bolted into position, there has been a constant tendency to work loose, thus frequently causing breakage or serious injury. Finally, it has been attempted to provide removable bushings, but heretofore with no great measure of success. Usually, by the way, such ends or heads have been constructed of cast-iron, which for several reasons have been objectionable.

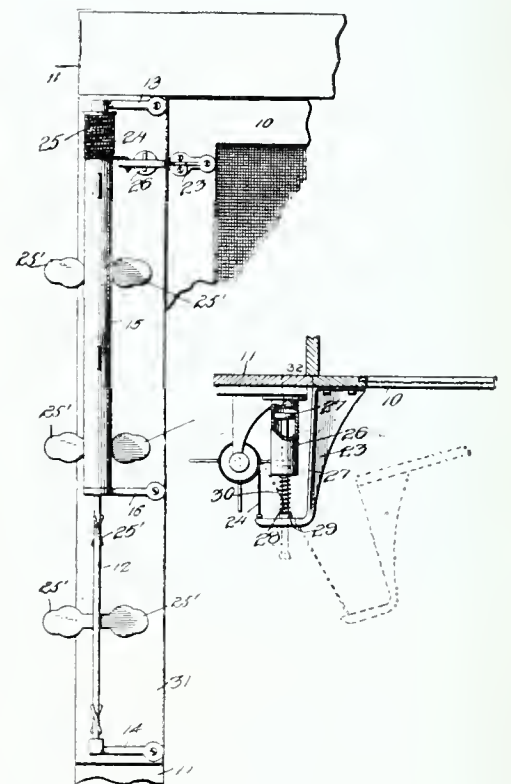


Mr. Royer S. Buch, of Elizabethtown, Pennsylvania, has invented an improved end or head and has obtained a patent thereon. The improved head is constructed of sheet-steel by stamping, whereby not only a very durable but a very inexpensive article is provided. The stamped steel

head or disk is provided with a central boxing, permanently riveted thereto, and with a bushing detachably mounted in said boxing, in such a manner that it may at any time be easily and conveniently removed from the boxing, the said bushing constituting the axle-box, which revolves upon the spindle or shaft provided for the purpose.

### Door Closer and Fan.

A combined door closer and insect excluder has been patented by Mr. Joseph A. Ramsey, of Beatrice, Neb. The object of the invention is to produce a device which will not only automatically close the door without slamming the same, but will create a strong draft at the side of the door opening to drive flies and other insects away when the door is opened. As shown in the accompanying cut, there



is mounted at one side of the door, a shaft 12 upon which is journaled a casing 15, said parts being connected by means of a coiled spring arranged within the casing. The shaft and casing carry a plurality of fan blades 25. Secured to the upper end of the door 10 is a bracket 23 having an overhanging end to which is attached a cord 24 wrapped upon the casing 15. A cylinder 26 is also arranged upon the door frame directly beneath the overhanging end of the bracket, and a plunger 27 arranged within the cylinder has a projecting stem 28, which bears against the bracket, this plunger being held in its outer position by a spring 30 surrounding the projecting end of the stem.

By this arrangement it will be seen that when the door is opened, the shaft will be revolved, thus rotating the fan blades and driving the flies or other insects away from the door opening. When the door closes the cord will be rewound upon the casing, and as the bracket comes into contact with the plunger stem, the plunger will be forced into the cylinder, so that the door will close gently and without slamming.



## THE UTILIZATION OF WASTES AND BY-PRODUCTS IN MANUFACTURES.

WITH SPECIAL REFERENCE TO THE DECADE OF 1890-1900.

By HENRY G. KITTREDGE, of the Census Bureau.

### PART XI.

#### OLD RUBBER.

Old rubber as a waste material is a thing of the past. Nothing containing rubber is discarded, but is utilized in some form of commercial utility. One thing that formerly rendered rubber comparatively valueless was because of its being vulcanized, which rendered it of little use for manufacture, due to the fact that it could not be remelted for mixing with new gum because of the sulphuric treatment it had received. This difficulty is now overcome, and the old rubber is blended with the new in certain portions with good results, enabling the manufacturer to reduce materially the price of his goods. Old rubber can be utilized, however, without being mixed with new material, by being steamed, passed between rollers, and in this softened condition applied to a strong, coarse fabric, or used for such purposes as stiffening the heels of boots.

In 1890 (United States Patent No. 420,820) a patent was granted to N. C. Mitchell, of Philadelphia, for a process of restoring rubber, with special reference to the treatment of rubber waste, such as old boots and shoes, for the purpose of recovering therefrom the rubber as a marketable product. By this process the old stock, after being ground between rolls and freed from foreign matters, such as metal, sand, and fiber, is exposed to the action of heat, preferably steam heat, for the purpose of devulcanizing and desulphurizing the rubber. The steam acts mainly in softening the rubber and has but little effect in removing the sulphur. The inventor of the process discovered that desulphurization may be effected by mixing with the rubber small quantities of sulphide of calcium previous to the treatment with steam. When calcium sulphide is used alone, a very high degree of heat is required to effect desulphurization, which high degree of heat dries the rubber to an injurious extent. It is therefore desirable to mix with the calcium sulphide some substance which will keep the rubber in a moist condition. For this purpose heavy petroleum is used, usually in the proportion of 7 pints of the mixture of petroleum and sulphide calcium to 200 pounds of rubber scrap. Seven pints of the fluid contain one-fourth of a pound of the sulphide.

#### SILK.

There is a large amount of waste made in the manufacture of silk which at one time was considered of comparatively little value. Now the reworking of waste silk has become an important and profitable industry. At the Dublin Exposition of 1865, a concern of Milan, Italy, showed some silk waste carded by hand and power, and spun into yarn, that attracted

a great deal of attention, and was the subject of interesting comments in the technical journals of that time. Silk-waste carding, however, was not an altogether new industry in Italy at that period, as there were then 10 or 12 manufacturers, employing upward of 2,000 men, women, and children, engaged in this occupation, with an annual production estimated at about 400,000 pounds. At the Paris exposition of 1867 the attention of the French jury was drawn to some exhibits in this line that were made at that time, and interesting mention was made of them in its report.

#### BREWERIES.

A patent was taken out in England in 1897 (Patent No. 3900) for a process to utilize the solid refuse of breweries, distilleries, starch and sugar factories, and the like. In the process described the refuse is treated with soda lye, and the pulp produced mixed with different kinds of finely powdered resins. The lye is then washed out with water, the remaining water is pressed out, and the residual mass is dried in a vacuum drying apparatus and finally pressed in molds while warm. The material is then claimed to be ready for use as laths, panels, wall coverings, etc.

The exhausted mash-ton grain in breweries is used for cattle food; and, while containing too much protein to be used alone, it is regarded as a most valuable food when mixed with hay. The amount of dry grains produced in breweries in the United States is estimated at 300,000 tons a year, and is all sold for cattle feed. Some breweries collect the carbonic-acid gas, that results in the process of fermentation, for soda water. There are consumed in the neighborhood of 50,000,000 pounds of hops annually in the United States in the manufacture of beer. These hops, when they become exhausted, are a veritable waste, and are buried or thrown on refuse heaps.

#### TIN AND MUSSEL SHELLS.

Among the materials used in the production of buttons are the remnants of the sheets of tin plate from which the buttons and caps of cans for blacking and other boxes have been cut. After the button blanks have been punched from these tin remnants, the scraps which are left are made into sash weights. Another article that was considered of little or no value ten years ago is the fresh-water mussel shell, which is now extensively used in the manufacture of buttons. These shells were used in the button industry of the United States in 1900 to the amount of 4,830,112 pounds at a cost of \$238,046.

#### GLASS.

Broken glass is now being utilized in the manufacture of artificial stone as a building material, which has been tested in France with apparent satis-

faction. The material is known as ceramic stone. The broken glass is first ground to a powder, and then devitrified by passing it through two furnaces, the second at a very high temperature, when the pasty mass is pressed, thereby acquiring form and solidity.

#### ASHES, ETC.

An artificial stone is said to be made in Germany of sifted ashes, potash, and other alkaline carbonates, gypsum, and slaked lime. It is said that this stone is not affected by atmospheric conditions. This mixture of sifted ashes and other materials is mixed with diluted sulphuric acid and hydrated sulphate of lime, forming potassium sulphate, which dissolves, leaving a plastic mass of gypsum to be molded by compression into the desired forms. To remove any alkali that may remain in the stone, it is immersed in a solution of alum acidified with sulphuric acid. The alum is decomposed and alumina formed, and this still further hardens the stone.

#### GLYCERIN.

In the manufacture of soaps a large portion of the glycerin contained in the oils and fats employed, passes in to the salty lye which is left at the end of the operation. A method has been suggested for recovering from this waste glycerin in a sufficiently pure condition for commercial purposes, ready for use without further treatment. The method employed consists in first treating the lye with an acid to neutralize partially the free alkali of the solution, and then to add sulphate of iron or sulphate of aluminum to complete the neutralization. The precipitate is filtered or otherwise separated. Evaporation is then employed to crystallize out the salt, and finally the resultant liquid is distilled to obtain the glycerin.

The wash resulting from the distillation of wine, molasses, beet root, and, speaking generally, from any alcoholic fermentative, contains glycerin, which is formed, during the alcoholic fermentation, at the expense of the sugar. A process of recovering

the glycerin from these residues is a recent invention of a Frenchman. The process consists in concentrating the wash by evaporation and treating it with an agent to neutralize the free acids contained therein, then subjecting the wash thus treated to the action of steam to carry off the glycerin contained therein, and finally condensing the glycerin. Aside from obtaining glycerin from the residues left from the distillation of wines and similar materials, may be mentioned other by-products, such as ammonia, tars, and salts. A process for the utilization of distillers' wash is the subject of another French invention patented in this country.

#### PRINTERS' INK ROLLERS.

There are now improved means of utilizing waste portions of printers' ink rollers, which have heretofore possessed but little commercial value, for the recovery of glycerin from the residuum of a process of distillation.

#### POWDERED MILK.

The manufacture of powdered milk has become in late years an industry of considerable importance. The main difficulty heretofore has been that milk could not be shipped to countries where it was scarce, owing to the fact that even in the condensed form it would keep but a short time. In very hot climates it is almost impossible to use condensed milk, as, after a can is opened, it has to be consumed almost immediately. Condensed milk also contains a large percentage of sugar and water, which add to the expense of freight. In powdered milk there is no water and absolutely no foreign matter, no chemicals being used in the process of manufacture. The product is made from sweet skimmed milk, by a process of simple evaporation. Not until lately, it is believed, has a milk powder been manufactured which would remain soluble, owing to the action of the heat upon the albumen; but in the process now in use the heat is so regulated that there is obtained a perfectly soluble product with almost no odor, and by adding the required amount of hot water a perfect skim milk is obtained. This solution may be precipitated by rennet in the same way that ordinary skim milk is precipitated; or, if allowed to stand for some time, it will sour in the same manner.

[THE END]

## PATENTS

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-THREE YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

INVENTIVE AGE

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

E. G. SIGGERS, 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Leonard W. Dexter, San Jose, Cal. Elevator.—The invention is designed as a hand-operated device adapted for household use to elevate wood, provisions, and other articles from a cellar to the upper floors of a building in a quick and convenient manner. It is especially adapted for use in apartment houses. It consists of a polygonal skeleton shaft made up of angle-shaped guideways at the corners thereof, a polygonal open-topped box or car mounted in the shaft with its upright edges working in the corresponding guideways, guide pulleys upon the bottom of the car and located between corresponding corners thereof, a hoisting cable having one end fixed at a point between a pair of guideways and its intermediate portion engaging the guide pulleys on the box, a fixed guide pulley being located opposite the fixed end of the cable, the free portion of the latter passing over the said fixed guide pulley. A counterbalancing weight is connected to a rope running over a pulley and winding on a weight drum independent of the box or car. The cable is connected to a winding drum. A tapered anti-friction guide roller is located in the path of the cable adjacent to the drum, so as to prevent the cable from binding upon the first floor when the elevator is arranged to rise above said floor.

Henry R. Meade, Greeneville, Tenn. Machine for Measuring Goods.—This machine is especially designed for measuring cloth in bolts, and is arranged to facilitate the placing of a bolt in a machine, and to provide for measuring the cloth as it is unwound from the bolt and rewound upon another bolt board. It consists of a frame embodying a base having a longitudinal groove formed in the upper face and at one side of the center thereof, opposite end uprights, one of which is provided with an opening registering with the adjacent end of the groove, a receptacle to loosely contain a roll of goods located opposite the groove, a measuring roll journaled in the upper portion of the uprights, an indicating device carried by one of the uprights and in operative relation to the measuring roll, a feed screw journaled in the groove of the base, a bracket inserted through the opening in one of the uprights and having a foot provided with a screw-threaded opening receiving the feed screw, a rotatable head journaled upon the bracket and provided with a pair of clamping jaws, and a rotatable endwise adjustable winding shaft.

Oscar E. Nickey, Bigspring, Texas. Combination Pad Lock.—An ingenious combination padlock is covered by this patent, simple permutation mechanism being employed, in which the combination may be readily changed and varied a great number of times without the necessity of disassociating the members or elements. The combination changing devices, however, are positively secured against accidental displacement, thereby obviating any danger of unintended changes while locked. The entire mechanism, with the exception of a single operating knob and coacting scales, is housed within a padlock casing of the ordinary form, and there is nothing which will give an unauthorized person a clue to the combination. The device is thus readily operable by one acquainted with such combination, but cannot be "picked" by one ignorant of the same. Broadly stated, the invention comprises the usual pivoted

shackle having a hooked free end that enters the casing and is engaged by a pivoted latch therein. This latch is actuated by means of a plurality of tumblers arranged on a central post and coacting with each other. The relation of these tumblers may be changed by one or more revoluble dogs, one of which is carried by an exposed operating knob.

James M. Taliaferro, Darlington, South Carolina. Tobacco Ordering Chamber.—The object of this invention is to provide apparatus by which tobacco can be expeditiously brought to proper condition with all the advantages of natural seasoning. A closed room is employed having walls formed of absorbent brick behind which is packed earth. Water is supplied to this earth from a suitable perforated pipe and the moisture exudes from the inner faces of the walls. Heating pipes of novel construction are located within the chamber, and upper and lower compartments are formed by means of slatted decks spaced from the ceiling and floor of the room. These compartments are connected at one end of the chamber by an upright conduit having a moistener arranged therein. A circulation of air through the chamber is obtained by an arrangement of fans that passes the air along the walls and through the moisteners, so that a thorough saturation takes place. Tobacco placed in this chamber can be quickly and efficiently ordered.

Chester L. Bell, El Paso, Texas, and James Halstead, Los Angeles, Cal. Fluid Operated Signal.—While the present invention is intended primarily for use on trains, the patent is broad enough to cover various modifications which may be employed for many purposes. The invention provides simple means whereby the engineer in his cab and the conductor in the caboose of a train can communicate with each other: the compressed air of the ordinary fluid pressure brake system being employed for the purpose. The system includes a pipe comprising sections secured to the undersides of the cars and having detachable couplings at their ends. Signal mechanism is located in the cab and caboose, and includes indicators of novel construction, together with valves, which control the supply of air from the brake system to the pipe and to the indicators, so that each indicator will automatically show the position of the other. In connection with these features are fluid operated alarms that are actuated simultaneously with the signals to draw attention to the latter.

Robert W. Christian, Bannack, Montana. Dredge Bucket. Two patents.—It is well known that the obtaining of gold from river beds by means of dredging machinery has become an important business in the gold-bearing districts of the country. Mr. R. W. Christian, who is superintendent of the "Gold Dredging Company," has made several improvements in machinery for this purpose and among the same are dredge buckets, more particularly the hinge joints between them. These points are exposed to excessive wear and cannot be made grit proof. Realizing this, Mr. Christian improved on the ordinary hinges by providing elements which receive all the wear and may be readily replaced by new ones, when necessary, without changing the entire bucket. To this end, said buckets are provided with aligned interlocking eyes, which receive detachable bushings. Through these bushings are passed the hinge pins. In one of the patents these pins are each provided at one end with a head that fits in a socket formed in the outer eye, the other end being secured by a plate detachably secured in a seat formed in the opposite eye. The later construction is even more simple,

for the hinged pins are simply sections of rods cut to the proper length and secured in place by cap strips fastened over the ends and to the outer eyes of the buckets. As all the wear due to the swinging action of the buckets comes upon the bushings and pins, these may be removed and replaced by new ones, as often as found necessary.

John Ahrends, Sunman, Indiana. Feed Trough.—The object of the invention is to provide a trough, which, while permitting of access to the feed placed therein, will prevent the animals from standing in the same. It is so constructed, moreover, that it may be readily and thoroughly cleansed. The body of the structure is V-shaped in cross section, one end being closed by an upright, though slightly inclined, wall constituting a support for that end of the trough. To this upright end wall is pivoted, by means of an upright pin, a cover supported by end blocks so that it will be spaced from the upper edge of the trough. This space permits the entrance of the animals' heads, but prevents their stepping into the feed. The free end of the cover carries a vertical wall that fits in the trough and constitutes the end thereof, this free end also having a depending latch by means of which the cover can be secured against displacement. In order to clean the trough, it is only necessary to unlatch the free end, raise it, and swing the cover to one side, whereupon the end of the trough is opened and all the contents may be swept or brushed therefrom.

Thomas Kendrick, Glenwood Springs, Colorado. Car Step.—The folding step covered by this recently granted patent is probably the simplest yet devised. A pair of hanger bars are pivoted to the lower stationary step of the car, and to their lower ends is hinged the folding step. This step is provided with rigidly attached curved arms passing through the hangers and having offset free terminals that abut against the rear portions thereof, constituting stops that hold the folding step in horizontal position when lowered. When in inoperative relation, the step folds flat upon the lower tread of the usual steps, where it is entirely out of the way, the quadrant arms being so located that they constitute handles which will permit the structure being grasped and turned over to operative position. The device is an improvement on a structure covered by a prior patent granted to Mr. Kendrick on August 2, 1898.

Frederick A. Schleppey, Lattimer Mines, Pa. Horse Shoe.—Horse shoes as now generally constructed are provided with screw-threaded openings in which the shanks of the calks are threaded. While it is comparatively easy to remove these calks before they are worn down flush with the face of the shoe, it often happens through carelessness or oversight that they are thus worn, and it is then extremely difficult to remove them. Mr. Schleppey has entirely overcome this objection by forming sockets in the outer face of the shoe and extending the screw threaded openings from the bottoms of these sockets. The calks are provided with the usual threaded shanks that are screwed into the openings, and furthermore, have angular bases that fit in the sockets below the plane of the face of the shoe, these bases being spaced from the walls of the socket a sufficient distance to permit the insertion of a tool. Thus, even if the calks become worn, the bases will be of sufficient height to permit the engagement of the tool, and thus the shanks may be readily removed.

William L. Manning, Wilson, N. C. Spring Gear for Vehicles.—A very important improvement in these structures is covered by this patent. The front bolster and rear axle are con-

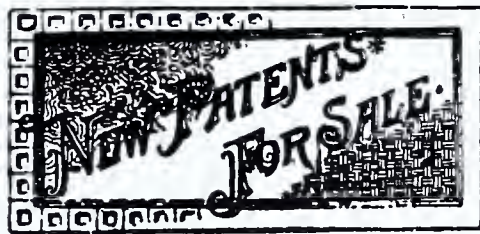
nected by the usual side springs, and to said springs are clipped transversely disposed body braces, formed of bar metal and having offset overlapped terminals. Riveted or otherwise secured to both of the braces and extending to the rear axle, are spaced reach sections located in parallel relation and constituting spring braces. Between the front ends of these sections is located a forwardly extending reach section riveted to the braces and having a bracket connection at its front end with the front bolster. The reach is thus made in three independent sections, the outer ends of the rear sections being clipped rigidly to the rear axle, while the outer end of the front section is fastened to the front bolster, all the parts being arranged in the same horizontal plane with the side springs, whereby the latter and the reach sections will respond at all times uniformly to the load imposed thereon.

Aurelius Howard, Wadsworth, Ohio. Rail Joint.—This invention relates more particularly to the construction of the bolts employed, though said bolts may be used for other purposes besides fastening rails together. No threaded nuts are used. Several shanks are fastened to a longitudinally disposed body bar and carry at their free ends pivoted heads which can be folded backwardly and interlocked with the shanks. These heads are held against displacement by means of rings or links surrounding the same and the shanks. In use, the shanks are passed through the openings of the rails or other articles to be connected, and a tie-plate is fitted upon the same, after the heads are folded backwardly against the tie-plate and fastened in place.

Abba Benton, Palalto, Ga. Fertilizer or Seed Distributer.—Upon an ordinary plow beam is pivoted a vibratory hopper having a curved metallic bottom that extends beyond one wall thereof and constitutes the feed discharge, the rear end of this trough being located above the tube formed by a metallic sheet fastened to the rear end of the plow beam. The hopper carries a forwardly and downwardly inclined actuating bar or arm that rests upon a ratchet disk fastened to a ground wheel, the ground wheel being journaled directly beneath and to the front portion of the plow beam. The ratchet disk is fastened to a hub portion that passes through the wheel and constitutes a boxing for the axle of the wheel. By this construction, a very simple distributer is provided which can be applied to any ordinary shovel plow and while particularly intended for distributing guano, may be used for seeding purposes if desired.

John C. Humphrey, Inventor, Claude S. Philips, assignee of one-half interest, Sutton, W. Va. Valve Operating Mechanism.—The aim of the inventor is to provide a wash bowl or other analogous receptacle with a valve which may be moved to an operative or inoperative position without the necessity of the operator immersing his hands in the water contained therein, at the same time doing away with holding-chains or the like, thus leaving the entire interior of the bowl clear and unobstructed. The discharge pipe from the bowl is constructed in two sections having their adjacent ends spaced apart. Bridging this space is a sleeve that slidably encloses the lower end of the upper section and is fitted within the upper end of the lower section. To this sleeve is attached a stem having at its upper end a valve that closes the discharge. The sleeve is operated by the lever connected thereto at one end, and having at its other end an upstanding stem projecting above the slab or stand in which the basin is placed. The lever is held against movement by a spring. To operate the valve, it is therefore only necessary to elevate or depress the projecting end of the stem.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent receptacle for molasses. Patented April 14, 1903. Can be manufactured at a good profit. Every housekeeper will have one. Send for drawings, free. Address, G. R. Turner, 19 Sewall Street, Augusta, Maine. (sep)

**FOR SALE**—Patent No. 726,809. Car Seal, dated April 28, 1903. Very simple and practical. A first-class patent. Terms \$6,000 cash. Address, Thomas White 139 West 27th Street, Ogden, Utah. (sep)

**FOR SALE**—Patent rights for building construction. Can be secured for single territories at cheap rates from the patentee. Address, H. Maring, Architect, No. 103 East 126th Street, New York, N. Y. (sep)

**FOR SALE**—Patent No. 725,956. Improved Railroad Switch. Prevents all wrecks from open switches; practical, simple, inexpensive to manufacture. Price \$10,000. Address, E. L. Alderman, 445 High Street, Holyoke, Mass. (sep)

**FOR SALE**—Patent No. 703,118. Draft Rigger for Railroad Cars. Address, Wm. H. Cox, Iron Mountain, Michigan. (sep)

**FOR SALE**—Patent No. 723,020. Grain Shocker. Address, Amil F. Ponath, Greatbend, N. D. (sep)

**FOR SALE**—One-half interest or the entire patent of a good practical machine for use in tin shops. Address, A. B. Hill, 634 18th St., Denver, Col. (sep)

**FOR SALE**—Patent No. 726,668. Wire Stretcher. Will sell outright. For particulars address, Charles J. Fox, Leavenworth, Kansas. (sep)

**FOR SALE** or manufacture on royalty—A patented pin for securing a belt. A new idea; not a buckle. Address, M. M. McGrath, 150 Maplewood Ave., Germantown, Philadelphia, Pa. (sep)

**FOR SALE**—Patent No. 723,173. Will no doubt be adopted by all railroads when fully known. Invented and patented by a railroad conductor. Patent for sale, or royalty will be considered. Address, J. W. Marthis, Columbus, Nebr. (aug)

**FOR SALE**—Patent No. 722,840. Machine for picking prunes or like fruits. Should be in the hands of every fruit grower. Address, John H. Hammer, Medford, Oregon. (aug)

**FOR SALE**—Patent No. 723,064. Cement Fence Post. Most practicable and valuable invention of the age. Stands up to every test. State, county, and township rights for sale. Address, Louis H. Stoner, Albany, Indiana. (aug)

**FOR SALE**—Patent No. 723,705. Grate. Easy to put in stove or range, and can be sold cheaply. Will save coal. Will sell United States Patent or sell state rights. Address, Mrs. Clara Nunan, Box 67, Cape Porpoise, Maine. (aug)

**FOR SALE**—Patent No. 723,248. Farm Gate. Testimonials furnished as to practical value of gate. Write for particulars to F. M. Dann, Footville, Wis. (aug)

**FOR SALE**—Patent No. 723,695. Metallic joint for cross bar, thill coupling, and poles. Malleable iron. Quickly put on. Simple and strong. For repairing broken tenons and irons cannot be beat. Address, John G. Lovejoy, Greig, N. Y. (aug)

**FOR SALE**—Patent No. 721,948, March 3, 1903. Wire stretcher for woven or barbed wire. Simple, rapid, durable, powerful. Proven the best. Ask for model. J. A. Foster, Salem, Wis. (aug)

**FOR SALE**—Patent No. 718,107, dated January 13, 1903. A dishwashing machine. Does good service, and is easily propelled. Address, Anna M. Dunder, Crete, Nebraska. (aug)

**FOR SALE**—Patent No. 723,364. Rail-joint Nut Lock. The best yet for safety, simplicity, durability and economy. For particulars address, Frank Chambordon, Braeburn, Pa. (aug)

**FOR SALE**—Patent No. 33,474. Railroad Rail. Price \$100. Address, Charles Kofske, Applington, Iowa. (aug)

**FOR SALE**—Patent No. 724,276. Corn Harvester and Husker. Very simple and practical. Address, Arthur Forgy, Middletown, Missouri. (aug)

**FOR SALE**—"Loop-the-Loop Basket Ball" is the new game. Device sold by—The National Psychological Institute, P. O. Box 52, Washington, D. C. (jly)

**FOR SALE**—Patent No. 652,655. Improved Trace Fastener. A splendid invention. Address, W. G. Lee Woods, San Antonio, Tex. (sep)

**FOR SALE**—Patent No. 721,606. Air Pressure Oiler. Works perfect in cold weather and in dust; simple construction. Will sell outright or on commission basis. The most meritorious article of its kind for the market. Address, W. A. Reinecke, Heizer, Kans. (jly)

**FOR SALE**—Car Seat patented Oct. 15, 1901, No. 684,747. It is a good and practical invention and a rare chance for a live man. Good reason for selling the same. Address, C. E. Cole, Box 131, Lindale, Ga. (jly)

**FOR SALE**—Patent No. 718,012. Automatic Rain Water Cutoff. Runs only clear water into cistern. Works without attention. Will sell outright or county rights. Also Saw Handle patent No. 562,787, and School Desk patent No. 520,026. Address, George J. Krieger, Jr., Wooster, Ohio. (jly)

**FOR SALE**—United States Patent No. 724,819, dated April 7, 1903. Also Canadian patent. Rotary Engine. Practically combines great power in a cheap and durable engine. Without a dead center. Address, J. M. Crowley, Carl Junction, Mo. (jly)

**FOR SALE**—Patent No. 724,587. Car-Truck Jack. Can be used on derailed railroad engines as well as cars. Price \$10,000. Address, Charles Kofske, Applington, Iowa. (jly)

**FOR SALE**—Patent No. 31,718. Washing Machine. It cannot be surpassed for washing heavy garments. Any child ten years old can operate it. Can be manufactured cheap. For further information address, J. R. Wilson, P. O. Box 63, McDowell, W. Va. (jly)

**FOR SALE**—Hoisting Mechanism for Traction and Portable engines. Will trade it for property or real estate. For particulars write to Fritz Bender, Litterlock, Mo. (jly)

**FOR SALE**—Patent for sale or royalty. Improved fire clay charcoal furnace. Just patented. Has proven to be a success. For particulars address, Charles J. Koch, 405 Congress Avenue, Austin, Texas. (jly)

**FOR SALE**—Patent No. 716,603. Issued Dec. 23, 1902. Indexed weighted hand plumb and level. Showing plumb and level or any desired degree of angle required on spaced degree article. Address, J. H. and A. E. Weyandt, Bowerston, Ohio. (jly)

## WANTED.

**WANTED**—A partner with capital to promote patent, manufacture and sell the same. Invention is a Rotary Engine of a new type. For particulars address, J. B. Pollard, Box 343, Roanoke, Va. (jly)

**WANTED**—I would like to hear from some manufacturers of Carriage and Wagon Makers Tools, etc. Address, D. L. Regione, 545 Wieland Street, Chicago, Ill. (jly)

**WANTED**—What have you to offer? Being manufacturers and large dealers in Agents' supplies, we are always looking for fast selling articles. Who has self-heating sad-irons? Address, Voorhees & Centennial, Trenton, N. J. (aug)

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

### A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. **THE ARMY AND NAVY MAGAZINE**, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00

## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America. For rates, address—

**The Railway and Engineering Review**, 1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,

Send for sample copies. ALLENTOWN, PA.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

FRED. B. NICHOLS & CO.,

913 E St., N. W.,

Wholesale Stationers, Washington, D. C.

## SELF-EDUCATION FOR MECHANICS.

A Monthly Journal intended as a Guide to Correct Methods in Work and Study.

25c. A YEAR. SAMPLE COPY FREE

Industrial Publication Co.,

16 Thomas Street, - - NEW YORK.

## ...SILK...

A JOURNAL PUBLISHED MONTHLY.

Devoted exclusively to the Raising of SILK and the Manufacture of the same. Only one dollar (\$1.00) a year.

Subscribe now. It contains information you ought to know.

Address,

**SILK PUBLISHING COMPANY.**

Tallulah Falls, Georgia.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— **The Inventive Age Pub. Co.,**

918 F St., N. W. WASHINGTON, D. C.

## BOYS Get a Good Stem Winding Watch FREE

You get 10 subscribers to a \$1.00 paper for 6 months at only 20 cts. each. You send us the 10 names and addresses and \$2.00 and get the watch. Perfect time guaranteed for 1 year. Full outfit free.

Address,

**AMERICAN HORSE-POWER.**

315 Dearborn Street, Chicago.

## ANALYZE YOUR BUSINESS

HYDROGEN is an inert gas.

OXYGEN consumes what it touches.

WATER consisting of two volumes of hydrogen and one of oxygen makes everything grow.

YOUR business, not advertised, would lie dormant.

OUR energies, without an object, would consume themselves.

UNITED our efforts will make your affairs grow more profitable, your operations more successful, and your bank account larger.

CO-OPERATION has always been the slogan of success

ALL progressive business men recognize this. NOTHING of importance can be accomplished without it.

GIVING our concentrated attention to increasing the business of each one of our clients by advertising methods suited to his individual case.

REGARDING his affairs as our own and giving him the benefit of our equipment, experience and qualified judgment, OUR efforts seldom fail to accomplish results desired

WHEN combined with the good business sense of the man who knows what he wants, and adopts the original, aggressive, exclusive methods of

**MAHIN ADVERTISING CO.**

200 Monroe St. Chicago.

**National ENGRAVING Company.**



Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

**THE INVENTIVE AGE PUBLISHING CO., Washington, D. C.**

I herewith enclose \$1.00 for one year's subscription to

## "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O.....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, JULY, 1903.

### Protection of Inventions.

We have recently received a letter from one of our correspondents inquiring if there is any way of protecting an invention, before an application for patent is filed in the Patent Office, except by filing a caveat. He suggests that the patent law be amended to authorize judges or clerks of courts to receive from inventors the specifications and drawings of their inventions, giving to the inventors certificates showing that such specifications and drawings have been duly filed. Thus, in case of a contest, the records of the court could be made use of to establish the date the invention was in the mind of the inventor.

The idea is a good one, and is entitled to serious consideration. It would probably be necessary for the clerk of the court to charge a small fee, say \$1, to pay for the trouble of receiving and filing the specification and drawing, and furnishing the receipt. One advantage of such an arrangement would be that the inventor could then file the paper in his county court, at a very small expense, without having to disclose to others the nature of his invention.

It very frequently happens that an inventor is unable to prove the date of conception of his invention, this being due to the fact that inventors, as a rule, are secretive, and do not like to take others into their confidence. A man may broach the subject of an invention which he may have in mind, to his wife, but here another difficulty presents itself, for should a contest arise, he cannot call her as a witness, as the law will not permit her to testify in his behalf. Therefore, inventors who disclose their inventions to their wives, are no better off than those who keep their own counsel.

The plan proposed of filing with the clerk of the county court a specification and drawing of the invention would enable an inventor, in the case of an interference contest in the Patent Office after the filing of his application

for a patent, to obtain from the county court a certified copy of the papers filed there, and thus he would be possessed of proof to establish his conception of the invention. The same result, however, could be accomplished if an inventor should, as soon as he conceives an invention, write out a description and make a drawing of it, and then go before a notary public, and have the description and drawing sworn to. Should there be a contest over priority of the invention, the affidavit could be made use of in the same way as the certificate from a court. Of course it would not be as satisfactory as filing the matter in a court, for there is always a possibility that such an affidavit might be tampered with while in the custody of an inventor, so as to introduce later ideas and suggestions, and obtain the benefit of the original date. This could not be done were the description and drawing filed in a court.

We should like to hear from others on this subject, as further discussion may develop even a better plan than the one which has been proposed.

### The Automobile Regulations.

The advent of the automobile and its reckless use in the hands of certain chauffeurs, has brought about various changes in the laws of cities and states concerning the handling of such vehicles. At present, Washington automobilists are much wrought up over the regulations which have been promulgated by the District Commissioners; but what would they think if the drastic provisions of the New York state law, which has just gone into effect, were to become a part of the municipal regulations of the District of Columbia? For instance, one of the provisions restricts the maximum speed to eight miles an hour. The New York law also allows the driver of a horse to stop an automobile by holding up his hand. Suppose that every driver should exercise his right in this respect: the progress of automobiles would be very slow.

There is a great future ahead for the automobile, but at the present time, the pedestrian and the horse have the right of way. Nothing will be gained by automobilists in fighting against this fact. Automobiles are in a minority at present. No good can come from disregarding present conditions.

The requirement that all machines should be numbered in figures sufficiently large that they may be seen both at night and during the day is an excellent one, as it removes the possibility of any accident occurring without the party being held accountable. It is idle to say that it takes less skill to direct an automobile than to drive a horse, though, whether it is so or not, there is no valid reason why all chauffeurs should not be called upon to pass an examination as to their ability to run the machine. If they are able to pass the examination, they will get a permit; if they are not, they should not be allowed to direct the operation of a machine which is likely to get beyond their control at any moment. This thing of putting an automobile in the hands of an inexperienced person to run recklessly through the crowded streets of a city is against all reason.

It is pleasing to note that those owners of automobiles, who are really responsible in the commercial sense of the term, and have a standing in the business world, are not opposing the reasonable and just regulations which have been put in force concerning the handling of automobiles.

### New Treatment for Tuberculosis.

The Medical Society of Berlin, which has done so much good in the past in furthering the cause of science and particularly the practice of medicine, is continuing its efforts in behalf of mankind in its search for a cure for tuberculosis, notwithstanding the comparative failure of the Koch treatment. During a recent meeting, at which were present many of the most eminent medical scientists of Germany, there was presented by Dr. Danelius and Prof. Sommerfeld, an elaborate paper describing their experiments with a new system of treatment for tubercular disease by inhalation, or rather fumigation, using the combined fumes of eucalyptus, sulphur and charcoal.

It appears that a Mr. Robert Schneider, a German merchant, having a practical knowledge of chemistry, observed during his travels in Australia that the natives in the north-western part used a decoction made by boiling the leaves and roots of the eucalyptus tree as a remedy for consumption, which is a prevalent disease in many sections of that country. He also observed that the natives, who lived in the districts where the eucalyptus tree grew abundantly, were generally immune from the disease, and that natives suffering from tuberculosis frequently came from other regions to live in the eucalyptus district, and with generally favorable results. From that he observed and learned by inquiry, Mr. Schneider concluded that the effective remedial agent was the eucalyptus, which is known in *materia medica* as a germicide and antiseptic, of recognized efficiency.

With the aid of a chemist, he prepared a combination of flowers of sulphur, powdered charcoal, and the pulverized eucalyptus leaves, impregnated with essential oil of eucalyptus. He called the mixture "sanosin," and it is the compound which has been used in the recent experiments. The fumes of sulphur have long been known to have a curative effect upon sufferers from phthisis, and it appears that the combination of sulphurous acid with eucalyptus and carbon (charcoal) has a peculiarly effective potency in attacking the bacillus of tuberculosis. On account of its extreme volatility, "sanosin" is put up in sealed glass tubes, each containing a dose of about 31 grains, in which condition it is to be sold, like other medicines, through authorized druggists. When used, the tube is broken and its contents poured on an earthenware plate heated by a spirit lamp: the volatile eucalyptus quickly evaporates, and, in combination with the small quantity of sulphurous-acid fumes generated, medicates with an aromatic, penetrating odor the air of a closed room, in which the tuberculous patient lives and inhales the curative influence in an easy, natural way.

The new remedy was brought to Berlin in September of 1902 and, after due consideration, it was taken in hand for elaborate scientific test and practical experiment. Prof. Sommerfeld, of the University of Berlin, — a leading authority in pulmonary dis-

ease—and Dr. Danelius, also a lung specialist, took charge of the experiments, and a special clinic was opened for that purpose. The patients were taken from the poorest class of sufferers, many of whom live at Berlin in damp, unsanitary dwellings, and through the public hospitals at all seasons of the year. So prevalent and fatal is tubercular disease among this class that, notwithstanding all science has hitherto done to restrain its ravages, the death rate in Berlin alone from that disease averages ten per day. Each patient admitted to the new treatment was required to present a certificate from the Royal Hospital, showing that he or she has been treated there and was suffering from progressive tuberculosis; many when admitted had reached a stage at which hope of relief by ordinary means had been abandoned. Thus far 120 patents have been treated, of whom it is stated more than 50 per cent have been discharged as cured.

The testimony of Dr. Danelius and Prof. Sommerfeld is that—

"The inhalations act with greater certainty in removing the catarrh which accompanies pulmonary phthisis than any other medicinal or physical measures directed to the same end. This is shown especially by the fact that the expectoration on the one hand decreases or disappears entirely, or, on the other hand—in acute cases—changes its character. The fact that the patient generally is quickly relieved from the troublesome and irritating cough is of the greatest importance, especially as the sleep, which is absolutely requisite for a recovery from fundamental disease, can then be obtained. The appetite in almost every case increases under the influence of the inhaled vapors, and through an increased consumption of food, the second preliminary condition for the cure is furnished."

So many sensational cures have been announced in recent years for phthisis, cancer, and other widespread human diseases, that the average layman is constrained to receive the announcement of further discoveries in the same field with a certain incredulity. At the same time it must be conceded that, in view of the importance of the subject, the record of what "sanosin" has thus far accomplished is entitled to a more than mere passing recognition. Of course, the period of experiment is too brief to form the basis of any definite conclusion. Physicians do not always accept the arrest of tubercular disease for so short a period as six months as proof of a permanent cure. The experiments have been the subject of keen and sustained interest among the foremost men of Berlin during the past months. The high authority of the tests which have been made, the encouraging nature of the results reported, and the fact that the results constitute an important step toward the scientific mastery of the disease which has become one of the most widespread and fatal scourges of the human race, give to the proceedings at Berlin a popular interest which transcends all the ordinary limits of pathological discussion.

Whatever may be said for or against this new treatment, it will probably be safe to accept for the present the conservative, but positive statement of Dr. Engel, the expert who was charged during the recent experiments with the examination of the sputum. He stated that under no other treatment has he seen the character of the sputum change so rapidly and uniformly, the diminution and disappearance of bacilli and the elastic fibers peculiar to tubercular disease, as under the treatment with sanosin.



## SCIENTIFIC

## PROGRESS.

## Perforating Iron Plates.

In a new process for the perforation of thick iron plates, the well-known combustion-supporting powers of oxygen are utilized. The plate that it is desired to perforate is heated to white heat by an oxyhydrogen blow-pipe, and then a stream of pure oxygen is turned on to it, when a hole of any determined size can be bored within a few minutes—not over five—in a piece of iron a foot thick.

## Process of Welding.

A new process of welding, evolved in Germany, was recently put to a practical test on a boat of the Hamburg-American line. The rudder of the steamship Sevilla had its stern-post broken, and by the new method, it was successfully welded together in about a minute. The process is also used by the North German Lloyd. Aluminum powder and oxide of iron are combined in a molten mass, with a temperature of 3,000°, which is produced in a few seconds. This mixture is poured over the parts to be united, and these are easily welded by simultaneous pressure, as their temperature immediately rises to welding-heat.

## Electric Fire Engines.

Experiments are now being made in Berlin with electric motor vehicles, adapted for fire service. One vehicle, which carries a reel of hose, ladders, etc., weighs, when loaded, about 2,200 pounds, and is driven by a four-horsepower electric motor, running at a speed of 1,500 revolutions per minute, and transmitting its power to the rear axle through a double reduction gear. The electrical energy is furnished by a battery of accumulators weighing 1,300 pounds; a speed of nine and one-half miles an hour can be attained, the motor taking 45 amperes at a pressure of 85 volts. Another automobile can attain a speed of 12 miles an hour, when on a level. It is driven by two electric motors, each of which is rated at nine-horse power, but can, on occasion, develop twelve horsepower. The battery, which weighs 300 pounds, has a capacity of 14 kilowatt-hours, and will propel the car for an hour at the speed described. The vehicle weighs 4 tons, including the motors, and complete with battery, hose, ladders, firemen, etc., 7 tons. The cost of the electric energy required to run the car twelve miles is estimated at 50 cents. The cost of the heaviest automobile is said to be about \$3,000; the expense, in service, is stated to be less than that for animal traction.

## Cheddite.

The very latest in the field of high explosives is a substance called Cheddite, which is now attracting much attention from mining engineers, quarry owners and others engaged in blasting operations. According to reports attested by well-known engineers and mine managers, there cannot be a doubt that the quarrying industry has now within its reach a powerful agent, by means of which mining and similar operations can be carried out more safely and more

effectively than ever before. For climates in which extremes of heat and cold are found, the new product is particularly important, as it can be transported, stored for any length of time, and used with absolute safety, being totally unaffected by hot or cold weather, or by sudden variations in temperature. It does not exude in warm weather; it does not freeze when it is cold; and as to its nonsensitive character, it is said that numerous tests have shown that Cheddite is safer to handle than explosives of the nitroglycerine class. In England, the railway officials are so convinced of its safety that they permit it to be transported by rail packed in an ordinary gunpowder metal cylinder, while a metal rectangle for the conveyance of gelignite by rail must be padded in such a manner as to form an effective buffer between the box and the metal. Nor is it liable to spontaneous combustion; and the gas generated is said to be not unpleasant, to cause no inconvenience, and to be accompanied by so little smoke that it is hardly noticeable. Its property of not freezing is perhaps the most valuable, as it consequently does not require thawing—a process which, with other explosives, is attended with danger, and results in a number of accidents every year.

## Hardening Car Wheels.

Mr. Daniel Eagan, of Philadelphia, Pennsylvania, has purchased a patent granted to Thomas Mitchell, of Chester, Pennsylvania, on an improved method of hardening treads of cast-steel car-wheels.

The general basis of the invention consists in the application, through a suitable mechanical agency, of air under pressure to the rim or tread of a hot steel car wheel, while movement is contemporaneously imparted to the wheel. In the operation of the apparatus, the wheel, at about a cherry red heat, is placed on a carrier or table and the latter is caused to rotate. The air pressure is then turned on through a supply pipe, and entering a circular distributing pipe, escapes from it in jets which play against the tread of the rotating wheel. The employment of air as a hardening fluid for the treads of the wheels is not only advantageous in the ease with which it may be supplied and controlled and the simplicity of the apparatus involved, but is particularly advantageous by reason of the very effective results which may be accomplished, it being, by its use, possible to produce any desired hardening of the treads operated upon, and in treating a large number of the wheels to bring the rims of all to a uniform hardness.

## Electrical Heater.

A German, Johann Friedrich Bolling, of Frankfort-Rockenheim-on-the-Main, Germany, has patented in this country an electrical resistance device or heater. This patent has been purchased by the Prometheus Electric Company of New York, N. Y.

The new resistance device or heater substantially consists of a strip of mica having on its surface a layer forming the electrical resistance, and a layer of suitable insulating material covering the resistance layer on the strip of mica, and metal strips which with their ends are pressed against the resistance layer by the insulating-

cover, and which form the terminals of the electric circuit. A cover of sheet-metal may be provided on one or both sides of the strip. The sheet-metal cover, which rests on the insulating layer, is provided with cut openings which allow the metal strips forming the terminals of the electric current to hold out of contact with the sheet-metal cover. The resistance layer may be fixed on the strip of mica by applying a coating of a thin solution of metal to the mica, and then heating the strip of mica to dry out the solvent. Resistance-strips of this kind are able to sustain high temperatures, and are very durable when the mica is pressed against another surface. However, it is to be taken into consideration that strips of mica which are suitable, for the purpose of fixing a resistance layer generally are not longer than two-hundred millimeters.

## Artificial Saltpetre.

German chemists have rendered the indigo plant unnecessary to the dyeing industries, by providing an artificial substitute that, except for permanence of color, answers the purpose very well; and now that natural saltpetre is becoming scarce, they have announced the discovery of a process for manufacturing it from the inexhaustible supply of air—common air, a chemical mixture consisting mainly of oxygen and nitrogen, the latter being an element of saltpetre, one of the most valuable of fertilizers.

The industrial importance of nitrogen, on account of its wide spread use in agriculture as well as in the manufacture of gunpowder, has occasional many efforts to find new sources of supply. Up to the present, the main deposit of nitrate has been in the saltpetre beds of Chile, and it is said that at the present rate of extraction, these will be exhausted in about forty years. Certain kinds of coal are known to produce nitrogen: the nitrate manure used in Germany is largely supplied from her coal mines. A method has been found of manufacturing nitric acid from ammonia, in large quantities. The process has the advantage of furnishing a fertilizer for agricultural purposes that does not contain sulphuric acid—thus dispensing with the cost of this product—and that has some 35 per cent of nitrogen—a higher proportion than similar substances.

A discovery of more far-reaching importance, however, has been the extraction of nitrogen direct from the atmosphere. The fact that this could be done has long been no secret: it is, in fact, a simple enough matter: but the problem was to turn it to economical account, and that involved the invention of a new process. It is reported that the question has been solved, and that a saltpetre has been produced with a higher fertilizing power than Chilean saltpetre, and at a cost that will make it a sharp competitor with the natural product. By means of electricity, calcium carbide is produced, and the nitrogen then combined with this salt, the resultant being called "lime nitrogen." The famous firm of Berlin electricians, Siemens and Halske, will put the new fertilizer on the market.

## Automobile Railway.

This month will witness experiments in France in the operation of an automobile railway, between Paris and Dijon. These trials have attracted wide-spread attention, and the results are awaited with interest. The cars which are to be used are called by the complicated name of "autonobile," which, it is explained, means that they are not only automatic but are motor cars as well: that is, they carry their own motive power, and at the same time run on railway tracks, like the electric cars that obtain their propulsive force from without. The name, in spite of its apparent difficulty of pronunciation, will perhaps come into general use as a distinguishing term for railway automobiles. In this connection, it is worthy of mention that the word "automobile" itself is of French origin and was introduced into the English language when it was realized that in brevity and descriptiveness, it far surpassed the clumsy appellations "horseless carriage," "self-propelled vehicle" or "motor wagon" that had previously been in use.

These automobiles, then, which will compose the new service, will run in trains of three, each car carrying forty passengers and comprising also a baggage-van, lavatory and a bar. The traction apparatus will be at the front. The total length of the car will be about 55 feet, and it said that the cost will be about the same as that of the present passenger cars. Petroleum, not electricity, will be used as the primary motive agent, and it is said that by a very little oil, a small quantity of water can be converted into the greatest propelling power of steam ever produced. The extremely powerful vapor thus obtained acts directly on the wheels of the car. The petroleum is consumed, but the water, first transformed into vapor, condenses afresh, reverting to its original condition, and is then more easily transformed again into steam, because it has retained its heat. In front of each automobile is an apparatus producing, by means of petroleum, the steam power requisite for propelling the car with its forty passengers and baggage. It is expected that the journey will be made at a minimum speed of 60 miles an hour, and that the distance of about 200 miles will be covered in three hours. As each automobile has its own apparatus, the cars can travel singly or coupled together.

It is claimed that the new train will save considerable cost in locomotives: that it will abolish smoke, steam, noise, vibration, the jolt incident to stopping and starting, and the necessity of taking up water. It also does away with the use of all men in charge of a locomotive, except the engineer. In order to overcome the air resistance entailed by the speed contemplated, the automobile in front and behind is so shaped as to cut the air, which thus becomes an auxiliary. The important thing to be avoided is overheating, and this question is of course receiving attention.

It is interesting to note that although these experiments are being made in France, an American is in charge.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy: twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued June 2, 1903.

### MECHANICAL PATENTS.

Acid. Making sulfuric.....M. Neumann  
Advertising device.....W. C. Carr  
Aerial vessel.....G. D. Shultz  
Aeroplane.....T. Gibon  
Agitation tank.....J. & L. Stoveken  
Air compressors. Unloading means for E. Hill  
Alimentary products. Machine for the production of coated.....L. Heilmann-Taylor  
Alloys. Production of.....E. Gates  
Amins. Making substitution products of aromatic.....R. Lesser  
Anchor.....W. A. Duncanson  
Animal trap.....E. F. McDaniel  
Ash or garbage can.....E. H. Huenefeld  
Atmospheric motors. Collapsible vessel for.....2 pats. W. M. Fulton  
Autographic register.....2 pats. H. Konerman  
Automobile controlling mechanism.....H. Lempert et al  
Automobile steering apparatus.....H. H. Buffum  
Axle box. Car.....P. F. Woods  
Badge fastener. Button.....C. A. Russell  
Baling press.....G. Senger  
Baling press.....W. Frost  
Balls, &c. Manufacturing composition for golf.....R. Hutchison  
Basket handle fastener.....E. L. Walker  
Bat. Base ball.....J. F. McCoy  
Battery.....D. H. Wilson  
Battery jar.....G. H. Condict  
Battery solution. Primary.....H. S. Amwake  
Bearing.....W. H. Wright  
Bearing. Ring spindle.....C. G. E. Salzberger  
Bearing. Spindle.....C. E. Lovejoy  
Beating engines. Removable bed plate for.....M. A. Mills  
Bed and commode attachment. Invalid.....W. C. Feely  
Bed bottom.....C. E. Lindsey  
Bed bottom. Spring.....F. S. Sprague  
Bed. Folding.....T. Hauser  
Bed head and back rest.....W. C. Feely  
Bed. Metal folding.....D. R. Roche  
Bedstead.....R. Cane  
Belt. Waist.....H. J. Gaisman  
Belt. Waist.....L. Sanders  
Berry box. Wooden veneer.....E. L. Walker  
Beveling tool.....C. Rosecrans  
Bicycle.....G. Seyfang  
Bicycle seat post and pump.....W. A. Allen  
Bicycle trailer package carrier.....W. F. Parker  
Binder. Loose leaf.....H. E. Veit  
Binder. Loose leaf.....2 pats. G. A. Roedde  
Binder. Temporary.....C. A. Hartmann  
Bleaching textile fabrics, &c. Apparatus for.....M. Haas  
Blind fastener.....J. J. Quackenbush  
Boat. Sectional.....B. McMonagle  
Boiler furnace. Steam.....E. R. R. Hoyt  
Bone cutting machine.....F. W. Mann  
Bookcase.....E. von der Groeben  
Book. Combination check and pocket F. J. Cook  
Boot black stand foot support.....F. Hodes  
Bottle.....A. Heusler  
Bottle. Non refillable.....B. Clemens  
Bottle stopper.....G. S. Barnes et al  
Bottle stopper attachment. Dose measuring.....J. W. Patterson  
Box fastener.....C. M. Johnson  
Box stand or bracket.....H. Luensmann  
Brake beam.....H. Vissering  
Brake beam.....H. W. Frost  
Braking system.....F. E. Case  
Brick.....J. L. Braun  
Bridge anchor.....P. P. Jacob  
Brush. Fountain tooth.....H. C. McKinley et al  
Brush. Wire.....W. O. Bement  
Buckle.....J. B. Heinold  
Buckle. Trace.....J. Fisher  
Building block.....P. Brandner  
Building blocks or artificial stone. Machine for molding.....C. H. Hutchings  
Building blocks. Supporting stand and mold for making.....L. P. Normandin  
Building construction.....J. P. Angell  
Burglar alarm for vaults, safes, &c. Electric.....C. O. Miller  
Burial case.....C. J. Duncan  
Button and necktie fastener. Combined collar.....E. A. Herr  
Button clasp.....B. F. Lentz  
Cabinet.....S. C. Price  
Calcium peroxid. Making hydrated.....G. F. Jaubert  
Callipers. Micrometer.....F. Spalding  
Camera range finder. Photographic.....A. L. Lewis  
Can body forming machine.....J. McGinnis  
Can or receptacle for ashes, &c.....H. Dolid  
Canning apparatus.....W. Smith  
Candelabrum.....J. Ferry  
Cane weaving machine.....E. H. Odom  
Car brake.....B. von Philp  
Car brake. Emergency.....J. M. Ross  
Car broom or brush holder.....D. Flagg  
Car buffer. Railway.....T. L. McKean  
Car center plate. Railway.....L. A. Shepard  
Car coupling.....J. Longinotte  
Car dumping doors. Attachment for winding shafts for.....A. Filer  
Car fender and sweeper. Automatic.....C. P. Cathcart  
Car. Fish transportation.....S. W. Parham  
Car signal.....M. L. Akers  
Carding engine.....C. Mills  
Cards. Machine for cutting or punching Jacquard.....V. Royle  
Carriage bow filler and support.....H. W. Cole  
Carriage. Collapsible baby.....J. P. Olofsson  
Casing and tubing elevator.....K. Chickering  
Casing and tubing elevator.....J. Scott  
Casket fastener.....F. I. Hoefle  
Casting. Alloy.....E. Gates  
Casting alloys.....E. Gates  
Casting alloys. Apparatus for.....E. Gates

Castings. Composition for use in producing metal.....C. W. Link  
Cattle guard.....L. W. Carden  
Celluloid compound and making same.....E. Zuhl  
Centrifugal machine.....M. Guttner et al  
Chair iron. Tilting.....J. M. Germanson  
Chart table.....J. C. Collamore  
Chart table.....J. C. Collamore et al  
Chisel. Mortising.....G. L. Hill  
Chuck jaw.....E. P. Bullard  
Churn.....M. F. Still  
Churn and butter worker. Combined.....F. Richardson et al  
Cigar box.....M. Brown  
Cigar piercer.....W. J. Bailey  
Classifier or sizer. Hydraulic.....J. F. Isbell  
Clay petrification.....B. J. Fallon  
Cleaning surfaces.....C. C. Mason  
Clutch. Friction.....S. Griffin  
Cock. Bib.....J. H. Savill  
Coin controlled apparatus.....S. Wohlheim  
Coin controlled mirror receptacle.....J. A. Miller  
Coin delivery apparatus.....A. Quambusch  
Collapsible gate.....C. Meyer  
Coloring matter containing halogen and making same. Indigo.....P. E. Oberreit  
Column.....G. J. Pfahl  
Column. Built up.....A. Mertes  
Combination lock.....C. F. Keller  
Combing machine drawing off attachment.....W. B. Jefferson  
Compasses. Drawing.....H. R. Beasley  
Compression coupling.....M. P. Boss  
Conductor.....G. E. Tinker  
Conduit and sewer rod coupling.....A. W. Case  
Cooling board attachment.....E. A. Fuller  
Copy holder.....J. A. Murphy  
Core composition.....E. F. Myers  
Cork puller.....R. Dressler  
Corn plaster. Sectional.....W. Mahler  
Corn preparing machine rolls.....W. R. Teeguarden  
Corn shredding machine baud cutter and feeder.....J. Crosby  
Corset.....M. P. S. Nottelle  
Cotton beater.....C. J. Morgan  
Cotton. Cleaning ginned.....H. Rembert  
Counter support.....G. H. Harland  
Crate. Basket.....A. B. Porter  
Crate. Folding poultry shipping.....L. E. Trachsel  
Cream separator. Centrifugal.....J. J. Berrigan  
Cream separator cylinders. Mechanism for operating.....M. Johnsrud  
Creamatory. Domestic refuse.....J. H. Cotter  
Cuff holder.....J. Jenkins  
Cultivator planter attachment.....W. Taylor et al  
Curling or waving appliance. Hair.....G. L. Hogan  
Current transformer. Alternating.....J. J. Frank  
Delivery of goods, &c. Apparatus for the lateral.....F. Hartmann  
Dental appliance.....E. W. Witter  
Dental dam holder.....D. Murlless  
Dental suction plate.....I. Malone  
Desk lock.....W. H. Collins  
Detergent.....H. C. Jones  
Die stock.....N. Sawyer  
Dish or plate.....J. D. Bates  
Dish washer.....S. J. Brown  
Display cabinet.....F. Hendrickx  
Display cards, &c. Back rest for.....J. H. Kevorkian  
Display counter.....J. S. Sherer  
Display mechanism. Automatic.....A. Klumpff  
Display stand. Rotating.....I. A. Nash  
Dividers. Proportional.....C. Fosby  
Door check and closer lever arm.....W. H. Taylor  
Door equalizer.....G. M. Haney  
Door fastener. Sliding.....W. Vorderfelde  
Door hanger. Sliding.....P. A. Myers  
Door. Revolving.....O. Cobb  
Dough dividing machine.....F. J. Ferguson  
Drill brace, &c. attaching device.....J. F. Steckenreiter  
Drinking trough for domestic animals.....J. F. Weitzel  
Drumhead.....W. H. Heybeck  
Drum tug.....W. R. Dunbar  
Dye and making same. Azo.....M. Kahn  
Dye and making same. Olive green sulfur.....A. L. Laska  
Electric circuit. Loaded.....H. S. Warren et al  
Electric cut out. Fusible.....W. P. Burke  
Electric heater.....T. J. Johnston  
Electric heater.....J. F. Hewitt et al  
Electric ignition generator.....B. P. Remy  
Electric machine brush holder and brush.....R. Lundell  
Electric machines. Regulating dynamo.....H. G. Reist  
Electric metering system.....E. Thomson  
Electric motor.....E. G. Richards  
Electric traction.....A. Megroz  
Electrical distribution system.....A. D. Lunt  
Electrical distribution system.....M. O. Troy  
Electromotors with rotating fields. Means for starting.....P. J. M. Girault  
Elevator brake.....J. P. McCurdy  
Elevator safety device.....G. Hail  
End gate.....J. C. & C. C. Butler  
Engine expansion joint.....A. T. Keller  
Engine fuel feed governor. Explosive.....I. Lauster  
Engine sparking igniter. Explosive.....C. A. Stickney  
Engines. Auxiliary fluid pressure apparatus for instantly starting steam.....K. G. M. Reichel  
Engraving machine.....W. T. Goodnow et al  
Envelope fastener.....C. W. Allen  
Evaporator. Salt brine.....H. Holmes  
Exhibiting apparatus. Merchandise.....T. R. Field  
Eye testing devices. Cabinet for exhibiting.....J. M. Johnston  
Eyeglasses.....E. A. Lewis  
Eyeglasses or spectacles.....G. F. Applegate  
Eyeletting machine.....W. L. Whittemore  
Fabric turfing machine.....M. W. Pitner

Fastener.....V. Kern  
Faucet.....F. Schueler  
Feed water heater.....A. E. Taber  
Feed water heater.....F. C. Trauer  
Feed water purifier.....F. O. Mechlin  
Feeder. Time stock.....M. Sarsfield  
Fence.....J. M. Nutt  
Fence. Panel.....M. K. Mahan  
Fence wire tightener.....R. A. Winters  
Fiber. Treatment of peat.....G. Py  
Filter.....A. Steinkoenig  
Filter bed cleaning apparatus. Sand & sats.....H. W. Blaisdell  
Filter. Metallurgical.....J. L. Stoveken  
Filter press.....J. & L. Stoveken  
Fire escape.....J. Aden  
Fireproof construction tension rod.....J. B. Hinchman  
Fireproofing construction.....W. F. Wilmoth  
Fishing line attachment.....C. W. Smith  
Flanging clamp.....J. H. Optenberg  
Flood gate.....B. Rastall  
Floor and ceiling construction.....J. Schratwieser  
Fluxes and operating transformers. Shaping rotary.....M. Leblanc  
Folding and delivery mechanism. Rotary.....R. T. Johnston  
Folding stand.....C. J. Widmer  
Fruit box.....W. R. Stokely  
Fuel. Making artificial.....G. Adrot  
Furnace.....E. H. Carroll  
Furnace.....T. G. Selleck  
Furnace charging apparatus.....J. F. Lewis  
Furnace charging apparatus. Blast.....A. P. Aiken  
Furnace forced draft appliance.....J. Sr., T. & J. Vickers, Jr  
Furnaces. Treating materials by radiated heat in electric.....C. G. P. de Laval  
Furniture brace.....W. D. Childress  
Fuse. Shell.....G. M. & C. F. Hathaway  
Galvanometer. Reflecting.....E. Weston  
Game counter.....E. T. Burrows  
Garment attachment.....J. Jenkins  
Garment hook. Coin controlled.....J. Scheibling  
Garment or placket fastener.....W. B. Murphy  
Garment supporter.....J. R. McColl  
Garment supporter.....O. Kraus  
Garment supporting apparatus.....M. M. Livingston  
Gas burner. Compound.....G. Axdorfer  
Gas engine.....R. P. Thompson et al  
Gas firing.....J. F. Zaruba  
Gas generator. Acetylene.....H. E. Marsh  
Gas governor. Volumetric.....L. J. Richards  
Gas or vapor engine.....R. A. F. Beilfuss  
Gas pipe automatic cut off.....F. P. Somers  
Gas regulating device for burners.....C. W. Taylor  
Gate.....D. J. Fuller  
Gear. Change and reversing.....W. G. Wilson  
Gear. Change speed.....J. Latille  
Glandular extractive product.....J. Takamine  
Glass articles. Manufacturing.....J. I. & C. V. Arbogast  
Glass shearing device.....E. Rogers et al  
Glassware articles. Joint for.....S. Hipkins  
Glassware manufacturing.....J. L., C. V., F. J., F. L., P. R. Arbogast  
Glove.....F. H. Busby  
Glove or mitt. Husking.....O. M. Scott  
Golf ball.....R. Hutchison  
Governor.....W. P. O'Brien  
Governor. Centrifugal.....E. Mathieu  
Grain screen and riddle.....G. H. Mood et al  
Gramophone needle box.....H. Sheble  
Grinding machine.....W. V. Robinson  
Gun. Machine.....W. G. Gass  
Hair. Artificial.....R. Freericks  
Hair pin.....W. E. Barcus  
Hat pin and manicure implement.....H. Rubens  
Hame attachment.....P. H. Du Bois  
Hammer. Automatic.....O. B. Roberts  
Hammer. Drop.....G. F. Fuller  
Hammers, &c. Nail holding attachment for.....G. W. Peek  
Harvester car stripping device. Corn.....J. P. Lamasney  
Harvester pitman connection.....E. A. Johnston  
Harvesting machine. Broom corn, &c.....L. A. Sproul  
Heat regulator.....W. Parker  
Hedge making machine.....J. Gohy  
Hinged or other movable members. Support for.....L. L. Berkowitz  
Hog trap.....M. Sage  
Hoisting apparatus.....3 pats. C. W. Hunt  
Hoof pad.....W. J. Kent  
Hose spanner.....C. Hanson et al  
Hose supporter clasp.....B. Pike  
Hot air furnace.....J. M. Beech  
Hub attaching device.....G. H. Marker  
Hub guard. Wagon.....W. Vredenburg  
Hammer. Aeolian.....A. G. Pierce  
Ice and refrigerating cars. Automatic apparatus for making.....N. W. Gregg  
Ice cake anchor bar.....T. H. Butler  
Ice machine freezing cylinder.....D. L. Holden  
Ice making machine or apparatus.....J. H. J. Haines  
Iceman's apron.....E. W. Fletcher  
Illuminating rooms opening on light wells. Device for.....N. Poulson  
Impact of bodies at a distance. Means for indicating the.....J. Urrutia y Motta  
Incubator.....F. H. Stoneburn  
Inkstand. Fountain.....F. N. Dorland  
Internal combustion engine.....H. F. Wallmann  
Internal combustion engine. Compound.....H. F. Wallmann  
Iron. Purifying.....S. L. Mershon  
Jar closure.....A. E. Bray  
Jar covers, &c. Securing device for.....C. A. Taum  
Journal automatic alarm. Heated.....J. S. Crawford et al  
Journal bearing.....A. R. Penprase  
Key.....A. E. Katz et al  
Kneading roller and retiring handles therefor.....R. R. & M. L. Hugunin et al  
Lacing hook setting machine.....2 pats. W. P. Bartel

Lace fastener.....F. W. Leopold  
Lacing hooks or the like to raceways. Mechanism for separating and feeding.....W. P. Bartel  
Ladder. Step.....M. Falk  
Lamp burner.....T. A. Matthews  
Lamp. Electric.....G. Stein  
Lamp. Electric.....A. J. Wurtz  
Lamp. Electric.....H. N. Potter  
Lamp holder for miner's caps.....C. R. Anderson  
Lamp holder. Incandescent electric.....S. S. Garvin  
Lamp. Incandescent.....W. R. Burrows  
Lamp or chandelier counterbalance.....H. F. Nehr  
Lamp receptacle.....H. C. Wirt  
Lamp. Safety household.....A. Carson  
Lantern.....J. T. Casey  
Latch and lock. Combined.....J. E. Keverline  
Lathe.....L. J. & F. J. Shead  
Lenses. Means for making bifocal optical.....T. Mundorff  
Level. Plumb.....D. N. Allard  
Library or like indicator.....R. Maconochie  
Light and rein holder. Combined.....E. Browning  
Lightning arrester for electrical plants.....G. Honsberg  
Liquid holder.....E. G. Nelson  
Liquid separator. Centrifugal.....J. Berrigan  
Lock box front.....G. L. Lavery  
Locomotive. Condensing.....D. R. Ivett  
Locomotive tender.....L. Atwood  
Loom dobbie mechanism.....J. T. Meats et al  
Loom jacquard mechanism.....J. Verdoll  
Loom pattern mechanism.....W. J. Lutton  
Loom picker stick connection.....E. Rivet  
Loom picking mechanism.....J. T. Meats  
Loom pile wires. Means for lubricating.....C. Baulk  
Loom shuttle.....J. E. Lemyre  
Loom take up arresting mechanism.....R. Jamieson  
Loom take up arresting mechanism.....J. Northrop  
Loom take up control.....C. F. Roper  
Loom take up mechanism.....J. Northrop  
Loom take up mechanism.....C. F. Roper  
Loom warp stop motion.....H. A. Owen  
Magnet for dynamo electric machines or motors. Field.....R. Lundell  
Magnets. Winding of revolving.....C. A. Parsons  
Magnetic separator. Subaqueous.....E. Gates  
Mangle.....A. T. Hagen et al  
Manuscript holder and line indicator.....A. Morison  
Match box.....2 pats. F. A. Wattenberg  
Meat press.....J. Carey  
Meat slicer.....F. Beecher  
Mechanical movement.....F. H. Lindner  
Metal heating furnace.....2 pats. T. V. Allis  
Metal sheets. Manufacturing.....T. V. Allis  
Metal unions. Manufacture of.....G. Chisholm  
Metals from ores. Apparatus for extracting.....J. & L. Stoveken  
Metals from ores. Apparatus for use in extracting.....J. F. Webb  
Metals. Uniting.....H. Goldschmidt  
Meter.....J. A. Tilden  
Mining coal.....W. Foglesong  
Mixing vessel.....S. R. Munson  
Monkey wrench.....J. S. Miller  
Mop and scrub brush. Combined.....A. S. Held  
Mop wringer.....T. R. Huston  
Motor.....C. T. Osborne  
Motor.....W. J. Boemper  
Motors. Starting and regulating the speed of induction.....P. J. M. Girault  
Mower. Lawn.....A. Lake  
Music leaf turner.....W. Baiko  
Music stand.....A. H. Lamb  
Musical instrument. Keyboard H. B. Tremaine  
Musical instruments. Means for retaining pianolas in position before keyboard J. B. Tracy  
Musical instruments. Transposing device for mechanical.....F. L. Young  
Muzzle. Calf.....A. J. James et al  
Nail cutter and implement.....E. Kaufmann  
Necktie fastener.....O. Kraus  
Nicotin absorber.....W. Schwartz  
Nicotin or other volatile constituents from tobacco vapors. Obtaining.....G. H. Lindenberger  
Nozzle.....J. M. Stouder  
Nut lock.....W. A. Scott  
Nut lock.....M. L. Thedford  
Nut machine.....C. P. Wetmore  
Nut wrench. Axle.....E. C. Wysonog  
Oil. Means for leading or discharging.....J. Baker, Jr  
Oil. Treating creosote.....C. W. Bilfinger  
Oiler.....G. Wilson  
Oiler. Piston bearing.....H. H. Buffum  
Optical measuring instrument. Cross wire for.....K. Hein  
Overflow alarm. Electric automatic.....R. J. Walker  
Packing. Metallic.....W. F. Somes  
Packing. Piston head.....J. R. Seemer  
Padlock.....A. A. Page  
Paint vehicle.....C. W. Bilfinger  
Paper box.....L. L. Duerden  
Paper clip.....J. M. Keep  
Paper pulp refining engine.....M. A. Mills  
Paralleling device. Automatic.....E. M. Hemphill et al  
Passenger supporting strap.....J. P. Swift  
Pen. Fountain.....R. A. Hamilton  
Pencil.....F. W. Musson  
Perforator and scorer. Automatic.....C. J. Mittler  
Photographic developing apparatus.....H. F. Northrop  
Photographic developing apparatus.....R. L. Chamberlaine  
Photographic negative. Mechanically printed.....T. M. St. John  
Piano attachment. Electric self playing.....C. H. Davis  
Piano damper.....E. Bornhoeft  
Piano tuning key.....M. Stoddard  
Picture frame.....J. W. Myers  
Picture frame hanger attachment.....F. A. Matthews  
Picture or mirror hanging device. Framed.....E. L. Smith



Pig rearing device.....F. Smith et al  
Pigeons. Timing device for homing.....W. C. Geary  
Pin.....G. W. Dover  
Pin.....J. Jenkins  
Pin joint.....G. W. Dover  
Ping pong table net holder.....A. Ek  
Pipe cutter.....A. W. Warnock  
Pipe. Manufacturing composite D. A. Ritchie  
Pipe roof joint. Vent.....J. Bropson  
Pipe wrench.....F. D. Bullard  
Plane guide.....J. W. Brady  
Planter. Check row corn.....P. E. Wistrand  
Plastic material. Pressure plate for polishing and surfacing.....V. L. Dunne  
Plow.....P. Lassen  
Plow. Power.....J. L. Parker  
Pocket knife.....E. Kaufmann  
Polisher.....E. T. Gilbert  
Pouch.....J. A. Smithline  
Power transmitting device.....E. D. Weyburn  
Power wrench.....2 pats.....S. F. Short  
Prescription blank and label combined.....W. B. Beach  
Press.....K. S. Blanchard  
Primary battery.....J. W. Gladstone  
Printing machine.....L. W. Southgate  
Printing press.....M. L. Severy et al  
Printing press bed plate motion.....J. A. Svensson  
Propelling boats. Means for.....M. S. Okun  
Propelling mechanism. Boat.....G. F. Bryan  
Pruning shears.....J. B. Rhodes  
Pulley. Self locking.....F. W. Smith  
Pump attachment for drilling or boring machinery.....2 pats.....A. Porterfield  
Pump. Duplex or twin piston.....E. Vogel  
Pump for high heads. Series high pressure centrifugal.....B. Jackson  
Pump rod coupling.....J. L. Strawn  
Pump. Rotary.....W. S. Sharpneck  
Pump. Rotary.....F. G. Bates  
Pump. Rotary.....M. W. Peterson  
Push button switch.....E. G. Kastenhuber  
Puzzle.....W. P. Van Loan  
Puzzle.....A. Keedell  
Puzzle. Street car.....M. H. Anderson  
Rail clamp. Guard.....F. M. Phillabaum  
Rail frog. Spring.....W. H. Rabbe et al  
Rail joint.....C. F. Hall  
Rail joint.....L. Lehotzky  
Rail joint.....I. Kicak  
Rail tie and brace.....T. J. Cahill  
Railway brake.....P. Hallot  
Railway coupling device.....C. G. Turner  
Railway overhead structure. Electric.....B. Willard  
Railway spike and tie plate therefor.....J. W. Macaulay  
Railway tie. Metallic.....J. H. Van Tassel et al  
Raisin seeding machine.....J. B. Crosby  
Rheostat. Starting.....C. E. Harthan  
Rocking chair.....C. L. Santee  
Rods or bars. Reducing.....J. R. George  
Rolling machine for forming lips on treads, &c.....G. F. Hutchins  
Rolling mill.....V. E. Edwards  
Rolling mill pinion housing.....V. E. Edwards  
Rolling mill top roll carrier.....J. R. George  
Roof. Building.....H. F. Langewische  
Roof splice.....P. Vogel  
Rotary engine.....W. P. Digby  
Rotary engine.....T. A. Diebold  
Routing machine cutter head.....V. Royle  
Roving and spinning machines, &c. Gage for setting rollers of.....M. H. Vaughan  
Rubber mat.....W. J. Ellis  
Sack holder.....P. F. Jellman  
Saddle. Harness.....C. Hoberrecht  
Safe. Fire and water proof.....J. Thomas-Kilham  
Saliva ejector.....J. B. Jordan  
Sand blast.....P. H. Long  
Sand drier.....H. W. Bohrmann  
Sash and frame. Window.....G. B. Determann  
Sash balance.....B. Blome  
Sash lock.....G. A. Bell  
Sash. Reversible window.....J. G. Robbe  
Saw mill. Gang.....W. M. Wilkin  
Scaffolding. Carpenter's.....E. A. Kuntz  
Scales. Combined panel and beam for computing.....M. F. Knox  
Scarf fastener.....H. J. Helberg  
Scene. Transformation.....W. A. Demmon  
Screen.....R. E. Hancock et al  
Screw holding device. Automatic.....J. A. Yates  
Seal lock.....G. B. Edgar  
Seat. Omnibus, tram car, garden, or other.....E. R. Halstead  
Seeding attachment.....E. K. Rea  
Seeding machine.....J. R. Kralinger et al  
Seeding machine. Sulky lister.....F. E. Davis  
Separator.....J. Roger  
Setting.....F. L. King  
Sewing machine. Sack.....J. L. Boyle  
Sewing machine take up mechanism. Shoe.....J. L. Kieffer  
Sewing machine work gage. Shoe.....J. L. Kieffer  
Shade and curtain bracket.....K. M. Dymond  
Shade fixture. Window.....G. R. Jennings  
Shade roller guard cap.....G. Mathis  
Shades. Friction holding device for spring actuated.....J. H. Milans  
Shaft and casing therefor. Flexible.....E. D. Weyburn  
Shaft connection.....H. Nyberg  
Shaft. Flexible.....J. K. Stewart  
Shafts. Means for electrically operating counter.....N. C. Bassett  
Shafting. Portable device for centering.....F. H. Hudson  
Sheet metal cutting machine.....A. G. Scherer  
Side board fastener.....J. Erret  
Sidewalks, curbs, and gutters. Mechanism for making.....D. B. Estell  
Sifter. Attached ash.....T. Edwards  
Sign. Double reading illuminated.....M. L. Jolly  
Sign or picture. Illuminated.....M. L. Jolly  
Silver. Reducing and separating.....G. V. Guzman  
Skate. Tubular.....W. G. Nott  
Sled.....J. W. Perkins  
Snap hook.....C. E. Smith et al  
Snap. Safety.....C. P. Allison  
Snap switch.....F. L. Fenn  
Sole leveling machine.....H. A. Webster  
Sound vibrations. Instrument for recording and reproducing.....E. J. Romano  
Speaking tube mouthpiece.....J. Finck et al  
Spectacle eye shield.....G. Moritz

Speed mechanism. Variable.....G. C. Nelson  
Spinning machine yarn controller and clearer.....G. Schmidt, Sr  
Spinning ring.....G. M. Warren  
Spur.....W. Olmstead  
Square and level. Combination.....F. L. Ress  
Stacker. Pneumatic.....C. N. Leonard  
Stamp. Marking.....F. Test  
Stapling machine.....V. Zwissler  
Steam boiler.....T. A. Gillespie  
Steam engine.....N. Francois  
Steam engine.....O. W. Kelly  
Steam engine.....E. F. Steele  
Steam engine.....P. S. Bostwick  
Steam superheating apparatus.....A. Bolton  
Steam trap.....F. Schwaninger  
Steam trap.....C. F. Murray  
Steam trap.....F. D. Koehler et al  
Steaming machine.....A. T. Sarfert  
Sterilizing water or other liquid. Apparatus for.....C. Caille  
Stone, &c. Apparatus for lifting.....J. Jones  
Stone sawing machine.....C. A. Thomson  
Stove attachment. Gas.....D. W. Ross  
Stove. Cooking.....H. Herufeld  
Street refuse. Apparatus for collecting mud, dust, or other.....W. H. Melvin et al  
Street sweeping machine brooms. Machine for making.....A. Schaefer  
Stringed instrument keyboard.....G. P. Buchanan  
Suction ventilator. Rotary.....J. Dickie et al  
Sugar cane syrup. Making.....J. Tillman  
Sugar. Making.....J. W. De Castro  
Sugar solutions. Boiling.....A. Grantzdorffer  
Sulfuric anhydrid. Manufacturing.....A. Clemm et al  
Suprarenal glands. Isolating the active principle of the.....2 pats.....J. Takamine  
Suprarenal glands. Obtaining products from.....J. Takamine  
Suprarenal glands. Preparing extracts of the.....J. Takamine  
Suspending device.....C. A. Benke  
Switch.....M. Obney  
Syringe.....J. H. Sheets  
Table, book rest, &c. Portable.....A. M. Brown  
Talking machine sound box.....E. D. Gleason  
Talking machine sound box.....E. D. Gleason  
Tap.....F. J. Nutting  
Tap. Beer barrel.....M. J. Chaplin  
Telephone exchange signaling jack. Multiple.....L. M. Ericsson  
Telephone exchange system.....C. B. Smith  
Telephone vocal guard.....W. J. Dunihue  
Telescope. Galilean.....A. A. Common  
Telpher.....H. M. Harding  
Tether.....G. K. Andrews  
Thill bow or thill tug and holdback. Safety.....L. W. Benner  
Tide and wave power.....F. Merziger  
Tie plate.....G. Wolhaupter  
Tile.....A. B. Klay  
Time reminder.....F. W. Baynes  
Tire. Wheel.....A. D. Van Ausdall  
Toaster.....J. L. Clark  
Tongue plate. Vehicle.....G. C. Thompson  
Tool. Pneumatic.....D. G. Foley  
Tools to handles. Means for securing.....A. P. Smythe et al  
Toothpicks, matches or like articles. Stand for.....R. Dickson  
Toy.....E. V. Clark  
Toy bank.....C. H. Schambers  
Toy. Detonating.....C. E. Wenzel  
Toy. Figure.....C. J. Dorsey  
Toy figure or doll.....C. A. French  
Toy gunboat. Detonating.....C. E. Wenzel  
Toy locomotive.....H. C. Ives  
Train order holder and deliverer.....J. J. Metz  
Tramway. Cable.....W. Dusedau  
Transformer.....M. Leblanc  
Traveling sprinkler.....J. P. Olofsson  
Tray.....A. H. Garde  
Tread. Safety stair.....J. A. McNamee  
Trenches. Apparatus for forming circular.....E. Quilling  
Trolley.....M. McBride  
Trolley catcher.....W. E. Pettie  
Trolley pole.....G. W. Hamilton  
Trolley stand.....W. Magner  
Trolley wires at railway crossings. Safety guard for.....C. D. Austin  
Trolling spoon.....A. W. Wilson  
Truck. Bag conveying and supporting.....A. J. Houle  
Truck. Hand.....W. H. Hart et al  
Trunk. Bureau.....N. Baruch  
Tufting frame.....J. H. Horstman  
Tug metal casing.....W. A. Lane  
Tunnel construction. Subaqueous.....S. Lake  
Tunnels. Building subaqueous.....S. Lake  
Turbine vane or blade.....T. Parker  
Type writing machine ribbon mechanism.....F. X. Wagner  
Type writing or similar machine and apparatus for use in connection therewith.....J. Lagarde  
Valve. Automatic flushing.....C. & F. A. Schossow  
Valve coupling. Air brake train pipe.....A. Oleson  
Valve. Cylinder relief.....A. J. G. E. Berg  
Valve for traps. Back pressure.....W. R. Bonnell  
Valve gate.....M. La Loude  
Valve. Gate.....S. S. Jacobsen  
Valve gear.....P. S. Bostwick  
Valve. Relief.....F. Schreidt  
Valve wrench.....L. R. Sack  
Vehicle. Motor.....J. D. Harp  
Vehicle. Motor.....P. J. Collins  
Vehicle propelling device. Ice.....I. N. Hennessy  
Vehicle. Road.....E. G. Hoffmann  
Vehicle wheel.....N. G. Moore  
Vehicle wheel.....J. M. Alderfer  
Vending machine.....D. James et al  
Vise. Carpenter's.....G. W. Drew  
Wagon. Merchandise weighing delivery.....J. J. Cahill  
Wagon storm apron or curtain.....H. W. Schlosser  
Washboiler attachment.....H. Achilles  
Washing machine.....S. J. Harding  
Washing machine.....J. F. Smith  
Waste. Bath or basin.....H. M. Weaver  
Watch barrel.....L. A. Erickson  
Water elevator. Windlass.....W. Lipps  
Water heater.....H. S. Powell  
Water motor.....F. A. Bradway

Water tube boiler.....J. Cowan  
Water. Removing oil or oily matter from.....A. E. Krause  
Watering apparatus. Automatic stock.....J. J. McCourt  
Weaving. Machine for manufacturing metallic leashes used in.....E. Guinet  
Weeding apparatus.....B. F. Conkle et al  
Wells. Underreamer for drilling oil.....M. H. Dunn  
Windmill.....W. M. Cherry  
Window.....F. Voigtman et al  
Window cleaner.....F. W. Wille  
Window frame and sash. Metallic.....C. McSherry  
Wire cable cutting device.....C. T. Mapes  
Wire drawing block.....E. H. Carroll  
Wire gaging and cutting machine.....F. W. A. G. & E. A. Hoefler  
Wrench.....F. von Cawenburgh  
Wrench.....J. H. Flanagan  
Yoke attachment. Neck.....L. T. Briscoe

## DESIGNS.

Badge.....G. G. Greenburg  
Glass. Window.....T. M. Farmiloe  
Spoon.....G. G. Greenburg  
Stone. Cut.....A. M. & I. Tolkowsky  
Table mat.....R. Stock  
Tiling.....5 pats.....T. F. Furness  
Tiling.....M. C. Boyer

Issued June 9, 1903.

## MECHANICAL PATENTS.

Abrading material and mounting therefor.....R. Gardner  
Adding machine.....G. F. Meier  
Adjustable chair or table.....P. C. Palmer  
Agitating apparatus.....W. H. Motter  
Air brake coupling. Automatic.....C. H. Seitz  
Air brake dust arrester.....T. M. Henderson  
Alarm system. Electric.....S. Schwarzchild  
Ammunition chest.....R. P. Stout  
Animal trap.....C. C. Bowen  
Animal trap.....A. D. Gaston  
Antiseptic and deodorizing compound.....H. P. Busch  
Armature. Dynamo electric machine.....C. P. Steinmetz  
Automatic gate.....E. W. Easley  
Automatically operated gate.....G. McElroy  
Automobile.....2 pats.....G. O. Draper  
Automobile lock.....B. D. Colby  
Awning.....H. C. Marcus  
Banana swing.....J. C. Skinner  
Band wheel scraper.....J. Tweedie  
Barrel head fastener.....H. H. Kromberg  
Barrel washing machine.....J. Muller  
Basin. Catch.....M. Cullen  
Bearing and support for universal mills.....F. Selling  
Bearing box. Adjustable.....O. S. Walker  
Bearing. Roller.....J. Kincaid  
Bed and couch. Combined.....D. T. Owen  
Bed. Folding.....3 pats.....D. T. Owen  
Bedstead attachment.....A. M. Hoyer  
Belt. Waterproof protected leather.....L. Loeb  
Bicycle balance.....M. L. Edmunds  
Bill holder.....J. H. Parks  
Binder.....H. C. Blackmer  
Binder. Extensible post.....F. W. Tobey  
Binder. Temporary.....E. L. Krag  
Binder. Temporary.....M. F. Wolff  
Biscuit and doughnut cutter. Combined.....N. A. Oliver  
Bobbins, cops, &c. Machine for packing.....D. G. Baker  
Boiler flue.....T. F. Bower  
Boiler furnace.....J. Smith  
Bolster.....T. Mitchell  
Bolts, screws, or similar articles in soft substances, such as wood. Means for fixing.....J. V. E. Thiollier  
Books. System of reference for account or other memorandum.....I. B. Hendrickson  
Boot or shoe. Leather.....G. E. McCormack  
Boring tool.....C. K. Sheets et al  
Bottle cap.....E. Norton  
Bottle cap shaper.....J. Gilbert  
Bottle. Non refillable.....C. A. Lindstrom  
Bottle. Nursing.....M. Bonnefont  
Bottle stopper.....J. R. Greenaway  
Bottles. Means and device for closing W. Wust  
Box blank pasting and folding machine.....E. G. Staude  
Box fastener.....A. Bennett  
Brake lever.....E. M. Akers  
Brewing.....H. A. Hobson  
Brooder.....O. H. Grosland  
Brooder. Poultry.....J. B. Ranney  
Brush. Toilet.....W. Wallach  
Bucket. Candy.....A. Bell  
Bucket. Ore or dredging.....R. J. Mefford  
Buckle.....G. W. Moores  
Buckle.....E. M. Turner  
Buckle. Cinch.....G. W. Gugler  
Bundle loader.....G. Briggs  
Button. Cuff.....H. A. Libaire  
Cable and drill tool socket. Union E. Strickland  
Cable coupling.....J. W. Cover  
Calcimine composition and producing same.....C. Adams  
Calendar. Wall.....W. C. Norman  
Camera. Photographic.....T. B. Mills  
Camera support.....H. W. Howe  
Camping utensil.....D. T. Abercrombie  
Can cap.....C. S. Bucklin  
Can or container for volatile oils, liquids, &c.....C. M. Gould  
Candlestick.....W. Haussermann  
Cane fork.....L. B. Lotz  
Car and system of mounting and wiring electrical apparatus thereon. Electric motor.....G. Gibbs  
Car door fastening.....E. A. Gauchet  
Car fender. Street.....S. H. Barton  
Car seat. Reversible.....F. Kohout  
Car. Single rail.....H. H. Tundis  
Car stake holder. Railway.....W. T. Edney  
Cars or similarly propelled vehicles. Safety guard for electric tram.....R. S. Buru  
Carbureter.....D. J. Esser  
Carbureter. Explosive engine C. A. Hedstrom  
Carbureting device for internal combustion engines.....A. P. Brush  
Carpenter's tool. Combination.....W. Potter  
Carpet fastener.....J. O. Dedman et al  
Casing or tubing elevator.....K. Chickering

Casing water packer.....C. Haas  
Casting apparatus. Ingot.....H. W. Lash  
Cattle guard.....J. W. Bireley  
Ceiling switch.....H. R. Sargent  
Cement. Manufacture of white.....O. Friel  
Chalk holder.....F. A. Daniels  
Check hook.....J. H. Allison  
Chimney flue cleaner.....J. A. Stine  
Chromatope.....G. Wells  
Churn motor. Manual.....T. D. A. Faubion  
Cigar bunches by expansion. Forming.....S. S. Williamson  
Cigar cutter.....W. F. Field  
Cigars. Machine for simultaneously cutting and branding.....I. W. Heysinger  
Cinco plate.....C. P. Weeks  
Clasp for garters or the like.....C. M. Simpson  
Clinometer.....W. A. Stallsmith et al  
Clock.....W. S. Scales  
Clock. Watchman's.....A. E. Waggoner  
Clothes drier.....C. H. Macklin  
Clothes hanger.....E. H. Lunan  
Clothes pounder.....N. B. Bacon  
Clutch.....F. Weimar et al  
Clutch. Friction.....R. C. Hills  
Clutch. Friction.....A. L. Stanford  
Clutch. Friction.....A. Herisson  
Clutch. Magnetic.....A. C. Eastwood  
Coal, &c. Machine for conveying, trimming, and transferring.....J. McBride, Sr  
Coffee pot.....M. C. Crawley  
Coin operated lock.....S. R. Parkes  
Column glued joint. Turned.....J. Neill  
Combing machine drawing motion. Cotton.....J. Slater  
Compasses.....G. Oberbeck  
Composing board in form of a galley for storing up composing columns.....O. Friese  
Composite tube.....R. W. Taylor  
Compressing system.....C. W. Vollmann  
Concentrating table slimer attachment.....C. T. Arkins  
Condiment holder.....H. B. Beach  
Confectioner's table and melter.....G. F. Dickson  
Continuous kiln.....W. P. Grath  
Controller apparatus.....P. S. Barrett et al  
Conveyer.....J. Fern  
Conveyer.....3 pats.....S. F. Joor  
Cooker. Electric.....E. E. Gold  
Cooler.....C. F. Conover  
Copper, nickel, or zinc ores containing precious metals. Ammonia cyanid process of treating.....D. Mosher  
Copy holder.....K. R. Williams  
Corn sheller.....F. C. Patten  
Cotton cleaner.....E. B. Ham  
Cotton compress.....P. K. Crowell  
Cotton picking sack or receptacle.....L. J. & C. W. Wilson  
Coupling.....G. Krebs  
Crib. Infant's.....T. H. Churchill  
Crusher and pulverizer.....M. J. Williams  
Crutch.....H. Maass  
Cuff. Sleeve.....J. B. Potter  
Cultivator weed destroying attachment.....O. C. Pennington  
Current motor. Alternating.....A. J. Churchward  
Current rotary converter. Constant.....R. Fleming  
Currents. Generating alternating A. D. Lunt  
Curtain.....4 pats.....E. H. Duchemin  
Curtain pole bracket and shade holder.....C. P. Searles et al  
Curtain roller.....E. H. Duchemin  
Cutting and countersinking tool. Combined.....A. E. J. Luckhurst  
Dental bite taker.....D. T. Huber  
Dental engines. Circuit controller for surgico.....J. S. Letord et al  
Dentist's or physician's pneumatic apparatus.....P. H. Stehley et al  
Disinfectant graduator.....J. H. Venners  
Disinfecting or fire extinguishing purposes. Water directing appliance for A. Verschuren  
Display cabinet C. J. & R. T. Van Valkenburg  
Display cabinet.....J. L. Tandy  
Display rack.....E. B. Weston  
Display rack. Carpet.....J. H. Davis  
Display stand. Jewelry.....W. J. Drain, Jr  
Door check.....F. H. Ogden  
Door check and closer. Combination.....W. H. Taylor  
Door. Grain.....J. Isaacson et al  
Door lock.....C. Ashmussen  
Door. Sliding.....I. E. McCracken  
Door track. Sliding.....H. C. Smith  
Drying apparatus. Vacuum.....W. C. Perkins  
Drying press. Steam.....W. E. Wines  
Drilling tool.....T. Murphy  
Drip pan signal device.....V. Ayotte, Jr  
Drum and fuel economizer. Combined heating.....S. J. McDonald  
Dye and making same. Yellow acridin.....K. Jedlicka  
Easel.....E. W. Kingsbury  
Electric circuit breaker.....R. H. Read  
Electric circuit repeating break.....L. Daft et al  
Electric machines. Mechanical ventilation of.....A. C. E. Rateau  
Electric meter.....E. Hartmann  
Electric motor controller.....J. B. Linn  
Electric motors. Controlling.....J. W. Kellogg  
Electric protective system.....J. Weatherby, Jr  
Electric spark.....D. Hanauer  
Electric time switch.....H. J. Cogswell  
Electrical conductor. Flexible.....L. Van Gilder et al  
Electrical rosette cut out.....C. D. Platt  
Electrically controlled lock.....J. Corbett  
Embroidery goods holder.....W. N. Houden  
Embroidery goods. Means for holding.....W. N. Houden  
Engine reversing gear. Gas.....M. H. Neff  
Excavating apparatus.....J. G. Bump  
Excavating apparatus.....G. McKay  
Exercising machine.....M. B. Ryan  
Explosion engine.....M. Pivert  
Explosives. Manufacturing safety.....A. McCracken  
Extension table.....G. Palladino  
Extension table.....G. H. Wood  
Eyeglass bow spring.....I. Fox  
Eyeglass holder.....M. A. Jordan  
Eyeglasses.....C. F. Ingold  
Eyeglasses.....G. A. Stiles  
Fan attachment.....B. Klein  
Fan. Automatic.....D. C. Beltz  
Farm gate.....E. Graham  
Fastening attachment.....W. G. Rasch



Faucet..... F. H. Havekotte  
Feed pan bracket..... G. G. Jones  
Feed. Steam boiler..... G. W. MacDougall  
Feed water heater..... W. Irving  
Feed water heater and condenser..... H. C. Moore  
Feeding mechanism..... J. Boylan  
Feeding regulator Steam boiler automatic.....  
Feet. Support for weak or deformed.....  
Fence building implement..... P. J. M. Gunthorp  
Fence stay. Wire..... E. F. Hall  
File. Newspaper..... C. H. Senour  
Filter..... F. R. Richards  
Filter. Disk..... V. A. Emond  
Filter press..... E. Simoneton  
Filtering system..... C. Kolb  
Firearm. Recoil..... F. A. W. Davis  
Fire escape..... J. T. S. Schouboe  
Fire extinguisher. Chemical..... C. J. Peterson  
Fireplace appliance. Open..... A. C. Badger  
Fish trap..... W. P. Richardson  
Fishing reel drag..... T. W. Haynie et al  
Floor construction..... H. W. Howe  
Floor dressing machine..... A. De Man  
Fly screen..... C. B. Wattles  
Foot arch supporter. Electric..... A. E. Walter  
Forge..... F. B. Lee  
Fruit grader..... R. Golze  
Furnace charging apparatus. Blast..... R. Strain  
Furnace reversing valve..... E. G. Rust  
Furniture. Adjustable..... J. P. Seigh  
Fuse. Electric circuit inclosed..... R. W. Elliott  
Gage..... W. S. Atkinson  
Galvanic battery..... S. D. Shriver  
Game apparatus..... J. R. Lord  
Game board..... B. Hurd  
Game board..... C. J. Dorsey  
Game board..... H. H. Rolfe  
Game board..... C. J. Dorsey  
Garment and watch-chain support..... J. V. Pilcher  
Garment clasp..... G. E. Hawes  
Garment hanger..... J. S. Heaton  
Garment supporter..... C. A. Williams  
Garment supporter clasp..... B. F. Orewiler  
Gas burner. Atmospheric..... F. J. Beaumont  
Gas distributing system..... M. Toltz et al  
Gas engine. Two cycle..... A. M. Coburn  
Gas furnace..... J. W. Keller  
Gas generator. Acetylene..... H. Baumgarten  
Gas lighting apparatus. Incandescent.....  
Gas or oil motor..... T. Gordon  
Gas tap or cock..... S. M. Balzer  
Gate..... F. A. Andrews  
Gate..... J. L. Riter et al  
Gate..... J. C. Zumwalt  
Gear. Variable driving..... S. M. Balzer  
Gearing. Differential..... H. L. Warner  
Gearing. Friction..... L. Maurer  
Gin. Roller..... L. L. Foss  
Gin saw cleaner..... W. D. Stanifer  
Glass molding machine..... S. Kribs  
Glove..... F. McConnell  
Gold beater skins. Drying..... E. H. & M. H. Swift  
Golf ball..... A. D. Seaman  
Governor..... A. R. Dodge  
Governor. Engine..... C. R. McGahey  
Governor. Pneumatic pressure.....  
Grate bar..... W. H. Nightingale  
Grinding machine. Cutter..... F. & J. F. Kernan  
Grinding mill..... B. M. W. Hanson  
Grinding or sharpening device..... C. C. Fusmer  
Grinding or sharpening device..... I. M. Rose  
Grinding wheels. Means for..... G. E. Metcalf  
Harness peg..... J. B. Fladby  
Harrow..... J. B. Fladby  
Harrow. Roller..... O. K. Oppen  
Harrow tooth fastener..... N. T. Nichols  
Harvester. Cane..... W. D. Whitney  
Harvester. Corn..... G. D. Luce  
Harvester. Corn..... reissue. G. D. Binns  
Harvester reel rake attachment..... C. E. Galbreath  
Harvester truck..... J. W. Pridmore et al  
Hasp fastener..... D. D. Nolley  
Hat binding..... D. D. Nolley  
Hat fastener..... C. E. Clark  
Hat fastener..... J. G. Closson  
Hat pin..... C. L. Munson et al  
Hat pin. Locking..... H. E. Stevick  
Hay loader..... J. Gross  
Hay or cotton press..... R. Hamilton  
Hay press..... A. S. Dixon  
Head rest..... M. F. Stadtmuller et al  
Head rest..... G. L. Grimme  
Head and heat light bath. Radiant.....  
Heater attachment..... H. J. Dowling  
Heating apparatus..... G. Lund  
Hides for robes. Machine for cleaning, softening, and drying tanned..... J. Sosenheimer  
Hinge..... S. D. Castle  
Hinge..... G. R. Hill  
Hoe..... J. F. Green  
Holdback hook. Vehicle shaft..... J. A. Donaldson  
Horse taming or training device..... G. Forsyth  
Horseshoe..... M. Schwartz  
Hose patch..... E. F. Peak  
Hot air furnace..... 2 pats. J. W. Hornsey  
Hydraulic controlling apparatus for hydraulic machinery..... F. L. Lane et al  
Hygrometer..... J. H. Gerrer  
Implement holder. Adjustable..... R. Baker  
Incubator..... O. H. Grosland  
Index. Card..... J. H. Rand  
Insulator..... W. G. Stroh  
Internal combustion engine..... F. G. Ericson  
Jar..... F. G. Ericson  
Jar closure..... W. S. Weir  
Jar closure..... E. Goltstein  
Journal bearing..... 2 pats. G. A. Woodman  
Journal bearing. Car..... J. M. Hopkins  
Keyboard operator..... O. A. Wolters  
Knob fastening..... G. W. Roberts  
Labeling machine..... F. E. Wenzel  
Lace..... M. A. Cox  
Lactose from whey. Producing..... A. S. Ramage  
Ladle. Molder's..... W. S. Anderson  
Lamp bulb. Incandescent-electric..... E. L. Elliot  
Lamp chimney cleaner..... J. B. Fladby  
Lamp. Electric arc..... C. E. Harthan  
Lamp globe holder. Arc..... J. C. Tournier  
Lamp hanger. Arc..... C. H. Shultz  
Lamp. Hydrocarbon incandescent.....  
Lamp. Incandescent..... G. Washington  
Lamp. Oil..... C. Hoelscher  
Lamp receptacle. Incandescent..... H. T. Paiste  
Land roller..... J. W. Morgenthaler  
Lasting hook..... W. L. Da Rozir  
Lead. Electrodeposited..... A. G. Betts  
Level. Spirit..... P. D. Smith  
Lifter..... W. H. Hendrix  
Lifting jack..... T. Wright  
Lightning arrester..... L. Bell  
Limekiln..... P. Martin  
Linotype machine..... G. A. Bates  
Liquid meter. Self acting..... E. Gallo fu Giuseppe

Liquids. Means for mixing and delivering..... L. J. Moser  
Load binding chains or cables. Retaining or releasing means for..... D. McLaughlin  
Lock..... J. Loch  
Lock tumbler. Combination..... W. H. Taylor  
Locomotive..... B. R. Van Kirk  
Log turner..... J. Scherer  
Loom for the manufacture of coil mats.....  
Loom picker..... O. Bullock et al  
Loom picker stick lug strap..... D. G. Rodgers  
Loom. Pile fabric..... R. G. Campbell  
Loom. Take up mechanism..... T. B. Dorman  
Loom take up mechanism..... C. W. Russell  
Loop banding machine..... F. S. Culver  
Lubricating device..... G. Macloski  
Lubricating device 2 pats..... B. F. Campbell et al  
Lubrication system. Splash..... A. P. Brush  
Lubricator..... G. Schneider  
Lubricator..... E. J. Mougette  
Lumber conveyer for double cutting band mills..... E. E. Thomas  
Magnetic suspension device..... W. H. Pratt  
Mail box..... G. Graven  
Mail box and support..... E. N. Sword  
Marble. Manufacture of compositions forming imitations of statuary..... L. Beaumel  
Marble or ball projector..... G. H. Hagan  
Mask. Fan..... P. Eschenbach  
Massage appliance..... J. H. Powers  
Match box and cigar cutter. Combined.....  
Measuring apparatus. Leather..... G. Priolella  
Measuring apparatus. Leather..... J. Thomson  
Measuring instrument..... J. J. Byrne  
Measuring instrument. Electrical..... W. H. Pratt  
Meats. &c. Basting apparatus for..... L. H. Edgar  
Mechanical movement..... A. J. Kappele  
Mechanical movement..... J. Hofmann  
Medicinal capsule and making same..... A. M. Hance  
Metal fabric for mats, &c..... E. A. Bedient  
Metal wheel..... S. L. Allen  
Metals from solutions. Apparatus for the precipitation of..... P. W. McCaffery  
Meter..... F. P. Cox  
Milk a food product. Producing from..... A. S. Ramage  
Milk heater or cooler..... A. Jensen  
Moistening and sealing envelops. Device for..... J. B. Wisner  
Molding machine..... J. W. Pridmore  
Molding machine operating mechanism..... F. J. Stratton  
Mop..... M. Miller  
Motive power apparatus..... E. Morrison  
Motor control system. 2 pats..... F. E. Case  
Motors generators. Means for preventing arcing in direct current..... H. H. Dow  
Musical instrument..... J. Connerly  
Musical instrument. Mechanical..... C. L. Davis  
Musical instrument. Stringed..... H. Steenbock  
Musical instruments. Pneumatic action for..... J. D. Phillips  
Neckband fastener..... M. T. White et al  
Neckband shaper..... J. A. Bartholme  
Necktie fastener..... J. Baumgarten  
Nozzle. Exhaust..... J. F. Hamilton  
Nursery chair..... G. H. Smith  
Nut lock..... L. D. Woods  
Nut lock..... M. Bartley  
Nut or pipe wrench..... D. Stewart  
Oil burning device..... B. K. Pickerrill  
Oil cake trimming machine..... reissue.  
Ores. Treating..... A. W. French  
Oven. Baker's..... E. D. Kendall  
Oven. Baker's..... G. H. McCausland  
Oven door. Baker's..... E. A. C. Petersen  
Oven. Roasting..... I. B. Galbreath  
Overflow alarm..... G. H. Rowland  
Package support..... J. J. Lepper  
Packing..... A. R. Dodge  
Packing. Piston rod..... S. J. Maddox  
Packing tube..... E. A. McMillin  
Pad or blank holding and feeding device..... R. B. Friend  
Paint and producing same..... C. Adams  
Paper. Device for grinding broken..... R. Dietrich  
Paper holder. Toilet..... R. B. Friend  
Paper receptacle opener..... W. Green  
Paper sheets or packages. Coin freed delivery apparatus for..... E. Martini  
Pasteboard horses or other animals. Rapid manufacture of..... J. Daxbek, Fils  
Pen. Fountain..... O. A. Morrow  
Phase indicator..... O. Holz  
Phase transformation system..... F. H. Jeannin  
Photographic mounting roller..... J. H. Hamp  
Photographic or like frame or other support..... J. Hartley  
Photographs. Producing colored..... A. A. Gurtner  
Pick..... J. L. Griffin  
Pick handle..... E. O. Thompson  
Picture frames, &c. Holder for..... F. L. Stafford  
Piling. Sheet..... L. P. Friestedt  
Pipe driving attachment..... S. S. O'Connor  
Pipe joints. Bearing sleeve for expansion..... H. J. Wessinger  
Piston. Expansive..... E. Thomas  
Plant or flower support..... L. F. Lacy  
Planter..... J. J. Kennedy  
Planter check row attachment. Corn..... G. S. Agee  
Planter. Corn..... J. V. Klein  
Planter furrow opener attachment. Corn..... H. Rentsch  
Plow. Sulky..... S. C. Cobb  
Plow. Wheel..... H. H. Boenker  
Pneumatic despatch tube terminal..... E. Steinbock  
Power factor indicator..... W. H. Pratt  
Power transmitting device..... T. Scheffler  
Printer. Automatic focusing solar..... H. Stender  
Printing and toning compound. Combined..... P. E. Schoenfelder  
Printing. Invisible impression..... E. W. Hall  
Printing press. Job..... F. W. Pohl  
Prints. Apparatus for making blue..... J. V. McAdam  
Projectile for smooth and rifled bores..... C. F. P. Stendebach  
Propelling vessels. Means for..... A. F. Godefroy  
Pruning apparatus..... B. E. Poole  
Pulley..... J. W. Strehli  
Pulley. Belt..... P. Medart  
Pulp. Making wood..... V. Drewsen  
Pump and compressor. Centrifugal..... C. W. Weiss

Pump. Centrifugal..... A. C. E. Rateau  
Pump governing device. Steam..... R. B. McGowan  
Push button. Electric..... A. W. Plassmann  
Pyrometer..... E. Childs  
Race starting gate..... J. Izatt  
Radiotherapeutic treatment apparatus..... E. K. Muller  
Railway..... E. Stiles  
Railway automatic safety appliance..... J. Bardsley  
Railway cattle guard..... F. W. Perkins  
Railway rail bond..... J. & M. W. Risbridge  
Railway tie..... S. McElpatrick  
Railway tie. Metallic..... F. U. Haymond  
Railway track joint..... J. S. Donohue  
Railway track joint..... O. F. McCully  
Railways. Switch especially adapted for third rails for electric..... W. A. P. Willard, Jr  
Reflector..... R. Fyfe  
Refractory article of manufacture..... S. L. Mershon  
Refrigerating machine oil separator..... G. T. Voorhees  
Regenerative furnace..... J. A. Durfee  
Relay. Reverse current..... E. M. Hewlett  
Rheostat..... C. E. Harthan  
Ring stamping apparatus..... W. H. Ford  
Rocking chair. Platform..... A. A. Van Slyke et al  
Rolling mill guide..... V. E. Edwards  
Rotary engine..... M. H. Sullivan  
Rotary engine..... M. E. Knight  
Rotary engine..... F. Jacob  
Rotary engine..... J. C. Monroe  
Rubber or other sap yielding trees. Device for grooving or tapping..... F. S. Robinson  
Rule and try square combined..... W. T. Whiteaway  
Ruler attachment..... H. Diflo  
Saccharimeter..... A. B. Lyons  
Safety deposit receptacle..... C. A. Lord  
Sash lock..... F. J. Hoyt  
Sawing machine. Wood..... W. T. Yard  
Scaffold bracket..... B. B. Brown  
Scale..... T. W. Kirkman  
Scale. Vehicle..... H. H. Chase  
Scraper. Wheeled..... C. H. Sawyer  
Screen..... E. T. Burrows  
Screen..... H. J. Coenen  
Screw cap closure..... H. J. S. Hall  
Screw driver..... L. S. Starrett  
Seal. Bottle..... H. S. Brewington  
Separator..... J. T. Burr  
Sewer water. Extracting the residuary matters from..... E. Vial  
Sewing machine attachment..... E. J. Fain  
Sewing machine stitch forming mechanism..... W. N. Parkes  
Sewing machine table. Folding..... A. Morley  
Shade hanger..... W. Disney  
Shade roller..... W. H. O'Keefe  
Shaft support..... S. A. Livingstone et al  
Shed. Portable folding..... T. M. Laswell  
Sheep shears..... H. Burgon  
Shingles from roofs or clapboards from walls. Device for removing..... G. W. Mitchell  
Shoe tree..... A. P. Redifer  
Show case..... F. Pollard  
Show case. Cabinet..... A. Bever  
Shuttle actuating mechanism..... J. N. Whipple  
Sign. Changeable..... J. N. Brady  
Sign. Electric..... H. B. Wren  
Signaling. Electromagnetic wave..... R. A. Fessenden  
Signaling. Wireless..... L. ke Forrest  
Siphon and bottle stopper. Combined..... J. E. Keller, Jr  
Siphon trap..... J. E. Keyt  
Skirt and waist adjuster..... R. E. Saffold  
Skirt holder..... S. D. Engle  
Skirt supporter..... N. C. Edwards  
Slicing machine..... W. Horrocks  
Smelting furnace..... E. Campbell  
Sparkling mechanism..... J. S. Dikeman  
Speculum. Nasal..... O. B. Monosmith  
Speed indicator..... J. Richi  
Spinning machine yarn guide holder..... C. G. Tideman  
Spraying device..... J. C. Tennent  
Square and protractor. Combination..... E. Oehrle  
Stacker. Straw..... A. M. Hood et al  
Stamping presses, &c. Table for relief..... E. W. Savory  
Station indicator..... J. J. Heberle  
Steam engine..... H. Steven, Jr  
Steam generator..... H. Friedenthal  
Steam generator..... W. Heury  
Steel direct from iron ore. Making..... M. R. Conley  
Stone, &c. Making artificial..... J. T. Saltiel  
Stone. Manufacture of artificial..... J. T. Saltiel  
Stove..... F. Krux  
Street sweeper..... Z. Whittemore  
Surgical fracture apparatus..... G. E. Gorham  
Suspenders..... I. Fuhrman  
Syringe..... F. M. Baker  
Syringe. Hypodermic..... P. J. McElroy  
Syringe. Rectal..... H. M. Guild  
Tank..... N. J. Clayton, Sr  
Tape into edging. Machine for threading..... D. Grotta  
Telegraphy. Space..... L. de Forest  
Telegraphy. Wireless..... L. de Forest  
Telephone exchange system..... J. J. O'Connell  
Telephone switchboard..... W. E. McCormick  
Thermostat..... E. W. Comfort  
Threshing machine..... E. W. Flag  
Ticket. Railway transfer..... W. F. Ham  
Tiles, slabs, &c. Manufacture of..... G. Kunick  
Tire. Pneumatic..... E. B. Rayner  
Tire. Vehicle..... W. Esty  
Tire. Wheel..... D. E. Griffiths  
Tongue support. Spring..... J. P. Barnes  
Tool. Combination..... N. Newman  
Tool heads to handles. Means for adjustably securing..... J. F. Kemp  
Tool relieving machine..... F. G. Echols  
Tower. Pleasure..... M. J. Doner  
Toy..... F. Strauss  
Track sanding mechanism..... E. M. Hedley  
Tramway towers. Rope sheave support and adjustment for rope..... B. C. Riblet  
Tree protector..... J. Schirra  
Tripod..... C. W. Lingle  
Trousers..... A. T. Buswell  
Truck. Car or other vehicle..... S. Otis  
Truck. Rigid arch bar..... A. Lipschutz  
Trucks. Appliance for use in coupling railway..... J. T. Woods  
Trunk. Saleman's sample..... J. O. Horsey

Truss..... T. W. Booth  
Tube closure..... A. L. Lambert  
Tubing. Clamp for removing..... J. H. Smith  
Tubing top..... M. J. Kirschner  
Tuft fastener..... D. P. Page  
Turbine bucket cutting tool..... H. Geisenhoner  
Turbine bucket. Detachable..... H. Geisenhoner  
Turbine. Steam or gas..... J. Stumpf  
Turpentine box..... R. L. Gaylord  
Type writer cabinet..... F. W. Tobey  
Type writer. Music..... I. F. Badeau  
Type writer silent key mechanism..... W. F. Helmond et al  
Type writing machine..... P. T. Dodge  
Umbrella handle..... L. Sievert  
Underreamer..... E. Strickland  
Universal coupling..... H. B. Brazier  
Urinal trap..... J. H. Brady  
Valve..... N. P. Pratt  
Valve and valve seat..... W. S. McLeod  
Valve. Balanced..... D. C. Prescott  
Valve. Balanced slide..... J. T. Wilson  
Valve. Triple..... P. Synnestvedt  
Vehicle body corner construction..... H. P. Wells  
Vehicle bolster and truck mechanism..... S. Otis  
Vehicle brake..... H. Appler  
Vehicle brake..... M. Kurz et al  
Vehicle. Steam motor..... F. E. Stanley  
Veil holder..... P. Till  
Vending machine..... A. A. Caille  
Vending machine..... L. W. Rubrecht  
Vending machine. Automatic..... R. P. Elliott  
Voting machine..... A. McKenzie  
Wagon. Dumping..... V. Brown  
Wall and concrete block for same. Building..... O. U. Miracle et al  
Washing machine..... J. Hofmann  
Washing machine..... O. E. Peterson  
Water elevator..... C. E. Harris  
Water heater..... J. F. Haley et al  
Water heater..... H. F. Gabel  
Water tube boiler..... G. Hansen  
Wave motor..... G. Nobletodt  
Well boring machine..... A. Kopperud  
Wells. Apparatus for removing drill tools from..... F. G. Irvine et al  
Wheel..... E. W. Mackenzie-Hughes  
Wheel fastener and axle protector..... G. Wood  
Wheels. Manufacturing..... H. Ehrhardt  
Winding machine. Ball or cop..... J. Good  
Windmill adjustable foot gear..... J. D. Downie  
Window..... D. G. Ednie  
Window drier..... J. G. Rostek  
Wire instrument. Hot..... M. C. Rypinski  
Wire straightening machine..... F. W. Mallet  
Wire stretcher..... J. V. Anderson  
Wiring machine..... A. O. Wilson et al  
Wool washing suds. Treating..... C. Shepherd  
Wrench..... T. L. Kennedy  
Wrench..... J. B. Tupper

## DESIGNS.

Brooch or buckle plate or similar article..... 2 pats. P. O. Dickinson  
Dish. Metal..... S. Stohr  
Plate or similar article..... C. A. May  
Radiator..... J. R. Wotherspoon  
Tiling..... O. Bergstrom  
Type. Font of..... W. Evans  
Type. Font of printing..... B. Nadall

Issued June 16, 1903.

## MECHANICAL PATENTS.

Acid of aromatic aldehyde and making same..... A. Steiner  
Sulfo..... C. Scott-Snell  
Advertising or the like..... C. A. Needham  
Aerial device..... C. S. Wilmeth  
Agricultural machine. Combined..... E. R. Plummer  
Alcohol heater..... H. Specketer et al  
Alkali metals. Manufacture of..... W. M. Fulton  
Atmospheric motors. Collapsible vessel for..... W. M. Fulton  
Automobile transmission gear..... J. W. Lambert  
Axle..... 2 pats. E. A. Judd  
Axles. Y-union for trussed..... W. C. Baker  
Baby jumper..... W. A. Marqua  
Bait box. Automatic..... N. Blanchet  
Ball..... 2 pats. K. V. Painter  
Bandage. Supporting..... L. R. Miller et al  
Bath tub safety device..... F. Mcall  
Bearing..... H. Hinkley  
Bed bottom. Spring..... T. J. Canivan  
Bed slat fastener and brace..... R. H. Shelton  
Bed warmer..... F. Avery  
Belt. Waist..... J. Forman  
Binder..... J. Bernau  
Blanket roll, field mattress, and clothing bag combined..... R. I. Clapham  
Blind operator and lock Window..... S. C. Sargent  
Boat..... I. A. Duvall  
Boat launching apparatus. Life..... S. H. Ury  
Boiler attachment..... C. L. Pagenhart  
Boiler fire box. Locomotive..... L. & C. Glover et al  
Boiler furnace. Steam..... G. F. Gallagher  
Boiler tube cleaner..... H. F. Weinland  
Boiler tube retarding device..... L. D. Lovokin  
Book. Apparatus for gathering sheets or signatures of..... G. E. Reinhardt  
Boots or shoes. Means for repairing..... G. W. Case et al  
Bottle. Non-refillable..... F. M. Arrington  
Bottle. Non-refillable..... E. T. Griffith  
Bottle stopper..... F. R. Magan  
Bottles or jars. Metal cap for..... C. A. Calleson  
Bottles, &c. Stopper device for non-refillable..... J. Guthrie  
Breastpin pin tongue and hinge joint..... G. H. Tilford  
Brick tile, or other machines. Machine for... feeding clay or other material to..... C. G. Rust  
Bridge. Bascule..... 2 pats. J. W. Page  
Brine. Purifying..... T. T. Gaff et al  
Brine purifying apparatus..... T. T. Gaff et al  
Brush wiper and holder..... J. Domagola  
Buckle. Belt..... J. Ueding  
Building blocks..... W. D. Kilbourn  
Burner..... T. Stiles et al  
Cabinet..... E. W. Woodruff  
Cables. Water tight union for lead..... G. L. Martin  
Calcium carbide. Preparing..... E. F. Price  
Calendar roll safety clamp..... H. A. Owen  
Camera. Film..... D. Graf  
Camera lens board guide and holder..... D. Graf



Camera. Ocular..... W. G. Randall  
Camera shutter..... W. K. Holmes  
Camera shutter..... J. C. Fyfe et al  
Can body forming and seaming machine.....  
..... H. C. Black  
Can opener..... H. Till  
Can opener and fruit jar clamp. Combined.....  
..... J. R. Fretwell  
Cans or tins. Machine for forming seating  
flanges on..... W. Moir et al  
Cane and chair. Combined..... R. C. Dulin  
Cane cart..... J. E. Gamalielson  
Car coupling..... G. D. Harlin  
Car coupling..... G. W. Smillie  
Car coupling..... 2 pats..... C. F. Springer  
Car. Dump..... J. V. Domingue  
Car or other vehicle fender..... G. Hipwood  
Car. Ore..... A. Stucki  
Car. Railway..... C. Zimmerman  
Car replacer..... T. N. Renfro  
Car seat..... G. C. Hawkins  
Car seat movement..... 2 pats..... E. T. McKaig  
Car step. Folding..... T. G. Clifford  
Carbonizing wood, &c. Retort for P. L. Laurell  
Carbureter air pump..... R. G. Speer  
Carbureting apparatus..... R. G. Speer  
Carrier..... S. H. Patterson  
Centrifugal machine..... H. Winter  
Centrifugal separator..... T. S. Patterson  
Chair attachment..... H. M. Young  
Chicken eye protector..... A. Jackson, Jr  
Clasp..... H. C. Frank  
Clock. Electric..... 2 pats..... J. A. Carruthers  
Clock pendulum..... W. H. Thompson  
Clothes hanger..... J. Webster  
Clothes line reel..... C. A. F. G. Brown  
Clothes pounder..... D. C. Clinton et al  
Clothes wringer..... D. Hall  
Clutch..... P. A. Houghtaling  
Clutch..... M. McHale et al  
Clutch. Friction..... J. C. Potter et al  
Coal compressing device..... J. B. Ladd  
Cock. Gas..... E. D. Booz  
Coffee extract. Apparatus for the manufact-  
ures of..... H. Eschwege  
Coke oven. Retort..... M. Updike  
Coke ovens. Apparatus for pushing coke from  
..... C. H. Wellman et al  
Coke ovens. Combined charging and discharg-  
ing device for..... C. H. Wellman et al  
Compasses. Pencil..... J. H. Miller  
Composition of matter..... H. L. Kubberuss  
Compound engine..... G. B. Petsche  
Concrete building blocks. Machine for mold-  
ing hollow..... H. S. Palmer  
Contact device..... H. R. Sargent  
Conveyer..... F. R. Willson, Jr  
Copying apparatus. Carbon..... J. W. Irish  
Corn cribbing apparatus..... W. C. Tichenor  
Corn husker and fodder shredder..... J. R. Hall  
Corn husking machine..... L. D. Swart  
Cornstalks, sugar cane, &c. Manufacturing  
products from..... A. V. Drewsen  
Corset..... reissue..... D. Kops  
Cotton compress..... R. D. Crow  
Cotton gin..... J. Brandon  
Crane. Wharf..... J. W. Seaver et al  
Cultivator..... G. A. Stelback  
Cupola..... T. Holland  
Curtain hanging apparatus. Window.....  
..... T. E. & J. C. Shevill  
Curtain pole..... G. W. Wise  
Cuspidor. Fountain..... J. V. Trenaman  
Cutter bar section. Self aligning..... G. L. Phelps  
Cycle. Motor..... S. Nechlediel et al  
Dam. Irrigating ditch..... C. D. W. Smith  
Dental engine attachment..... J. C. Holson  
Dental flask press..... W. Finn  
Dental pliers..... C. S. Case  
Desk. School..... J. A. McLaughlin  
Desk. School or other..... C. W. Robbins et al  
Diamagnetic metal from sands, &c. Separat-  
ing..... E. Gates  
Diamagnetic separator..... 4 pats..... E. Gates  
Diamagnetic separator..... 6 pats..... E. Gates  
Dish washing machine..... J. G. Cochran  
Disinfectant..... G. Chism  
Dispensing apparatus..... D. B. de Walloff  
Display box..... F. W. Smith  
Display cabinet. Package..... J. M. Callander  
Door hanger..... H. L. & H. J. Ferris  
Door stop and securer..... J. G. Coffman  
Door. Swinging..... W. R. Pitt  
Draft equalizer..... E. E. Louder  
Draft equalizer..... O. Torgerson  
Draft rigging..... L. A. Hoerr  
Drawing frame..... L. J. Wrigley  
Dressmaker's guide..... L. W. Morgan  
Drills, &c. Adjustable support for G. C. Gauer  
Druggist's mass divider..... J. W. Jackson  
Dumping apparatus..... W. J. Newman  
Dynamic force of bodies. Device for overcom-  
ing the..... A. J. Myer  
Dynamos to railway cars. Device for attach-  
ing..... J. F. McElroy  
Educational appliance..... O. P. Austin  
Educational device..... J. T. Goodman  
Electric boosters. Controlling M. J. Wightman  
Electric controller..... G. W. Gilmore et al  
Electric machine. Dynamo..... H. G. Reist  
Electric motor electric controller W. K. Liggett  
Electric motor system..... G. O. Baker  
Electric motors. Means for operating alternat-  
ing current..... R. Eickemeyer  
Electric wire terminal tip..... H. L. Worthington  
Electric wires. Device for handling live.....  
..... R. Wilbur  
Electrical transformer..... A. R. Everest  
Electrodes for electric accumulators. Produc-  
ing..... E. W. Jungner  
Electromagnetic vibrating reed..... S. F. Jones  
Elevator doors, &c. Operating mechanism for  
..... F. K. Fassett  
Elevator safety device..... P. Bending  
Ellipsograph..... R. Carlton  
Embossing roll automatic feed stopping me-  
chanism..... C. R. Baker  
Engine belt guide. Traction..... W. H. George  
Engine cylinder. Oil, spirit, or gas..... H. Austin  
Engine electrical igniter. Explosive.....  
..... C. E. Sargent  
Engine reversing mechanism G. W. Anderson  
Engine vaporizer. Internal combustion.....  
..... O. B. Perkins  
Engraved plates when printing therefrom.  
Wiper for cleaning the surface of..... F. E. Blaisdell  
Explosive engine..... E. E. Williams  
Eyeglasses..... C. C. Stone  
Fabric racking machine..... H. Bittner  
Fan..... C. A. Eck  
Fans. Electric motor for ceiling..... P. Swan

Feed water heater..... F. W. Luedke  
Feed water heater..... T. C. McBride  
Feed water heating system..... T. C. McBride  
Feed water regulator..... A. G. Mumford et al  
Feed water regulator..... R. Learmonth  
Fence post..... C. A. Reed  
Fertilizer manufacturing carrier A. J. Sackett  
Fifth wheel..... J. Burns  
Fire alarm. Automatic..... D. Beaulieu  
Fire box..... L. & C. Glover et al  
Fire escape and table..... J. E. Burns  
Fire escape. Portable..... W. B. Field  
Fire hydrant..... reissue..... W. W. Corey  
Firearm ejector..... C. W. Bartholmes  
Firearm. Recoil operated..... J. M. Browning  
Fireproof construction..... N. Pelligreen  
Fireproof flooring..... N. Poulson  
Fish line reel..... E. D. Rockwell  
Fish trap..... O. Watson  
Fish trap. Floating..... J. A. Miller et al  
Fluids or fluid mixtures. Apparatus for heat-  
ing..... F. S. Chapman  
Flushing apparatus..... R. F. Gillin  
Folding box..... reissue..... Z. B. Webb  
Foot ball..... A. Crossley  
Friction brake..... A. E. Reynolds  
Fuel feeding apparatus..... 2 pats..... L. K. Davis  
Furnace charging device. Blast.....  
..... M. W. Johnson, Jr  
Furnace shaving feeder..... J. C. Leary  
Furnace ventilating door..... J. Sidaway  
Furniture. Knockdown..... J. Richards  
Fuse. Plug..... H. C. Wirt  
Fuse terminal..... W. R. Goodman  
Game..... L. B. Lewis  
Game apparatus..... D. H. Talbert  
Game apparatus..... C. K. Clark  
Garbage crematory..... J. A. Forsyth  
Gas engine..... J. M. Smelser  
Gas. Making producer..... F. W. Mattiessen  
Gas or other burners. Apparatus for supplying  
air or other combustion supporting fluid or  
substance to..... T. J. Little, Jr  
Gas regulator..... C. C. Wilson  
Gas shut off. Automatic..... B. M. Sheets  
Gas. Treating..... O. N. Guldin  
Gases. Cleaning fans operating on blast fur-  
nace..... B. H. Thwaite  
Glassware grinding machine..... E. C. Schrader  
Grain elevator..... C. R. Benedict  
Graining machine. Molding..... B. W. Augustine  
Graphophone..... C. S. Tainter  
Grate and smoke consuming fire bridge. Com-  
bined..... A. Weil  
Grate. Fire..... I. Schoeffler  
Grater and masher. Vegetable..... E. Hemstram  
Grinding machine carriage reversing mechan-  
ism..... Z. R. Tucker  
Hame. Sheet metal..... C. L. Wiedrich  
Hammer handle blank..... A. J. Doughty  
Harrow..... C. Shabley  
Harvester..... W. N. Whitley  
Hat guard..... A. Ribaud  
Hay and shocked grain loader. Combined side  
delivery..... F. M. Conroy et al  
Hay press..... A. Ziller et al  
Hay press..... J. E. Fiance et al  
Hay rack construction..... H. L. Ferris  
Heating furnace..... J. F. Barker  
Heel protector. Shoe..... L. F. Riemer  
Heel seat and counter beating machine.....  
..... C. L. Eaton  
Hinge..... E. W. Christ  
Hinge..... J. St. Amand  
Hoist. Electric..... F. Nather  
Hollow bodies. Apparatus for forming serpen-  
tine..... K. Park  
Hook..... F. M. Chandler  
Horse checking device..... S. W. M. & G. L. Kollock  
Horseshoe..... J. Dillon  
Horseshoe attachment..... E. L. Abbott  
Horseshoe pad..... R. P. McDougall  
Hose coupling..... E. J. Pace  
Hose holder..... J. C. Garvey  
Hose supporter..... D. Basch  
Hot water boiler. Air tight..... L. & S. Mayhew  
Hydrocarbon burner. Incandescent.....  
..... E. Lehmann  
Indoxyl. Making..... P. E. Oberreit  
Ink reducer and making same..... F. Fisher  
Ink well..... H. G. Squires  
Insulated joint for railway rail joints.....  
..... B. G. Braine  
Iron rods for making ladders, &c. Machine  
for bending and twisting..... W. A. Ehrmantraut  
Ironing board..... L. B. Cake  
Ironing machine..... W. M. Barnes  
Ironing machine..... D. H. Benjamin  
Jar..... F. H. Gibson  
Journal bearing..... M. L. Hoyt  
Keyboard instruments. Means for modifying  
the action of strikers in mechanism for play-  
ing..... R. W. Pain  
Kinematographic pictures. Means for exhibit-  
ing..... J. A. Prestwich  
Knitted pants and their manufacture.....  
..... H. H. Middleditch et al  
Knives, forks, or similar articles. Manufact-  
ure of table..... H. Joest  
Ladder. Flexible..... W. A. Ehrmantraut  
Lamp..... E. P. Brown  
Lamp. Electric arc..... R. Fleming  
Lamp. Electric arc..... J. L. Davies  
Lamp holder..... T. Sharp  
Lamp. Miner's..... T. Gossack  
Lamp. Multiphase arc..... R. Fleming  
Lantern and foot warmer. Safety J. M. Darrah  
Lantern. Tubular..... F. M. Stevens  
Last..... J. St. Amand  
Latch. Gate..... C. E. McEwen  
Latch. Gate..... G. W. Merker  
Lathe die head..... R. M. Nuttall  
Leather dressing machine..... H. C. Lavington  
Letter sheet and return sheet. Combined.....  
..... R. R. Lawson  
Life belt..... F. W. Kern  
Life belt. Pneumatic..... J. A. Malmqvist  
Light controller. Time..... E. Newman  
Line lock..... J. Simmors  
Liquid transfer apparatus..... B. Ready  
Loading apparatus..... F. B. Metosh  
Loading machine..... J. E. Jones  
Lock..... J. Pellington  
Locking washer..... W. J. Cook  
Loom..... H. Lindsay  
Loom..... J. C. Brooks  
Loom. Lappet..... C. A. Littlefield  
Loom picker stick check..... T. E. Norman  
Loom warp beams. Journal bearing for.....  
..... O. L. Owen

Loom protector mechanism..... E. S. Stimpson  
Mail bag catcher and deliverer.....  
..... C. R. Hawkins  
Mail box..... S. A. Jones  
Mail box. Rural..... C. F. Mackenzie et al  
Mail conveyance. Rural route..... J. H. Gross  
Map..... J. F. Mayes  
Measure. Taylor's..... M. E. Fairbanks et al  
Mechanical movement..... G. Holliday  
Mechanical movement..... A. Plagman  
Mechanical movement..... M. Burton  
Mechanical movement..... J. F. Cooley  
Medicine wrapping film..... M. Kobayashi  
Metal pouring machine..... W. S. Mather  
Metal shears..... T. F. Lippengood  
Metal working appliance..... J. P. Johnson  
Metals from ores. Apparatus for extracting.....  
..... O. A. Ellis  
Metals. Uniting..... A. Dick  
Metallic oxides. Apparatus for making.....  
..... M. Jacobi  
Milk product and making same..... J. W. Dowler  
Molding hollow articles. Means and apparat-  
us for..... C. Huber  
Molding machine..... F. W. Hastings  
Mop wringer..... E. Chagatte  
Mowing machine attachment.....  
..... A. Middleton et al  
Multispindle machine. Automatic..... F. M. Davis  
Music leaf turner..... S. T. Hutchinson et al  
Music pocket. Portable sheet..... F. W. Parkin  
Music roll..... F. R. Wyckoff  
Music sheet spool. Automatically adjustable.....  
..... P. Wuest, Jr  
Musical instrument..... P. Wuest, Jr  
Neck and ear muffler. Combined..... J. C. Scott  
Nozzle. Spray..... A. J. Koegler  
Nut and washer. Vehicle spindle cap.....  
..... G. Martien  
Oil lock..... H. A. House  
Oil burner..... R. G. Speer  
Oil burner..... F. Saffell  
Oil burner..... W. H. Wafer  
Opera glass..... J. W. Riglauder et al  
Ordnance firing attachment..... G. Gerdorn  
Organ stop actions. Adjustable thumb board  
for combination..... C. Stollewerk  
Overseaming machine..... J. M. Merrow  
Package. Original..... H. W. Pape  
Packing..... C. B. Rush  
Packing box..... W. Berryman  
Packing. Rod..... J. S. Klein  
Packing. Rod..... H. A. Howe  
Painting machine for vehicle wheels, &c.....  
..... J. Kraft et al  
Paper box covering machine..... R. A. Thompson  
Paper cutters. Clamp coupling device for  
automatic..... C. Seybold  
Paper cutting and folding machine..... S. D. Ruth  
Paper server and paper package therefor.....  
..... S. Wheeler  
Pasteurizer..... W. J. Ruff  
Pattern plate for folding and marking gar-  
ment sections..... P. J. Menahan  
Pedal attachment..... A. J. Hamme  
Petroleum burner..... J. Frick  
Photographic lens system..... E. Lohmann  
Photographic printing frame..... G. F. Fraley  
Photographic printing machine..... H. Casler  
Piano action. Upright..... E. Bornhoft  
Piano. Automatic..... P. Welin  
Pie plate or bake pan, &c..... M. Thorne  
Pigment and making same..... W. J. Armbruster  
Pigments. Making..... W. J. Armbruster  
Pipe cleaner..... J. C. Kuhlman  
Pipe cutter and vise..... W. G. Wilson  
Pipe joint and stuffing box. Spherical.....  
..... W. F. Boardman et al  
Pipe or hose coupling..... C. W. Martin  
Pipe union..... L. H. Flory  
Planer or shaper tool..... A. Ryden  
Planter..... S. B. Swilling  
Planter. Corn..... P. T. J. Monson  
Planter. Corn..... W. S. Graham  
Plaster package..... F. F. Hawkins  
Plastic material. Manufacture of ornamental  
articles from..... J. F. Whitman  
Playing ball..... C. B. Elliott  
Playing ball..... A. E. Barnhart  
Plow..... E. A. Brooks  
Plow..... W. L. Paul  
Plow..... T. H. Harris  
Plow. Disk..... J. Harrison et al  
Pole. Metallic..... W. S. Gray  
Power translating device..... W. O. Worth  
Power transmitting mechanism..... 2 pats.....  
..... I. Lehman  
Printing device. Rolled wrapping paper.....  
..... E. Wilson  
Printing machine delivery mechanism.....  
..... B. C. Annand  
Printing. Preparing metals or alloys for lito-  
graphic..... O. C. Streckler  
Printing press delivery apparatus.....  
..... W. Evensen  
Printing press paper cutting and feeding device.....  
..... W. Scott  
Propeller. Vessel..... B. Charles  
Protractor. Molding knife..... A. F. Nye  
Pruning implement..... W. T. Woodyard  
Pump..... A. Dellanna  
Pump. Automatic duplex steam..... A. Jack  
Pump. Centrifugal..... E. W. Brooks  
Pumping system..... J. G. Steiner  
Purse or pouch..... J. P. Luther  
Race starter..... A. J. Escude  
Rail joint..... G. Gow  
Rail joint..... J. P. Heuer  
Railway automatic signaling apparatus.....  
..... J. Goldsworthy  
Railway construction..... P. Dunwald  
Railway. Electric..... W. M. Brown  
Railway rail..... J. G. Wentzell  
Railway rails. Joining or connecting.....  
..... J. F. Koehler et al  
Railway switch adjustable bridle rod.....  
..... H. A. Lawler et al  
Railway tie and means for connecting the rails  
thereto. Metal..... F. H. Smith et al  
Railway track sand guard..... J. P. Newell  
Ram. Hydraulic..... H. Culpin  
Razor. Safety..... H. Wilcox  
Razor strop..... G. C. Blasdell  
Reaping, mowing, or binding machine finger.....  
..... R. Cresswell  
Receptacle. Transportation or storage.....  
..... R. C. Andersen  
Reflector for head, search, or other lights.....  
..... H. H. Taylor  
Resistance set..... 2 pats..... E. F. Northrup  
Revolving screen..... V. W. Mason, Jr

Ring frame spindle..... T. E. Leigh  
Riveting machine..... M. W. Wilkins  
Roasting furnace. Muffle..... F. Meyer  
Roofing. Metallic..... G. W. Armstrong et al  
Rotary engine..... J. C. Beckfield  
Rotary explosive engine..... R. Cumming  
Rotary steam explosive engine D. P. Fuqua, Sr  
Roving can..... E. Andrews  
Rule or scale. Universal fraction W. F. Leavell  
Ruling machine..... A. Keach  
Safe. Domestic..... M. M. Enders  
Salt box. Animal..... U. Heater  
Sand guard..... E. L. Degreee  
Sandal strap turning machine..... A. H. Higgins  
Sash holder..... L. T. Weyer  
Sash lock..... A. E. Ayer  
Sash lock..... J. D. Miller  
Saw. Buck..... C. T. Redfield  
Sectional boiler..... E. M. Faucher  
Seeding machine..... C. N. E. Gray  
Seeding machine. Broadcast..... C. N. E. Gray  
Sewing machine feed..... J. M. Merrow  
Sewing machine trimming device J. M. Merrow  
Sewing machine trimming mechanism.....  
..... J. M. Merrow  
Shaft coupling. Angle..... S. W. Robinson  
Sharpener. Disk..... T. M. Anderson  
Sharpening device for moving knife blades.....  
..... W. D. Quigley et al  
Sharpening machine. Drill..... J. Retallack  
Sheet metal cutting machine..... A. E. Chambers et al  
Shelving..... G. W. Sues  
Shirt..... C. Uebel  
Shirt waist..... J. M. Ide  
Shoe. Leather..... H. C. Jenney  
Shutter or door. Rolling steel J. H. Swearingen  
Sign. Automatic door..... M. H. Richardson  
Skirt. Riding..... M. Weingarten  
Slicers. Self feeder for fruit or vegetable.....  
..... S. J. Evans  
Smoke consumer..... J. M. Kersey  
Smoke consuming apparatus for furnaces or  
boilers..... C. G. Bracklow et al  
Smoke stack. Reversible..... S. T. Walton  
Smoke stacks. Derrick for raising J. G. Steiner  
Snap hook..... W. Cooper  
Snap hook..... C. W. Carter  
Snow plow..... C. L. Wyckoff  
Speed indicator..... M. R. Hutchison  
Spike puller..... W. Scott  
Spinning and twisting machine. Combined.....  
..... E. E. Bradley  
Spinning machinery yarn controller.....  
..... S. Schackleton  
Sprayer. Hand..... A. O. Freeman  
Stamp. Portable hand H. E. & H. S. Reynolds  
Stamping machine..... F. H. Richards  
Starching machine..... W. Hess, Jr  
Steam engine. Compound reciprocating.....  
..... W. L. Casaday  
Steering and retarding mechanism. Barge.....  
..... I. H. Larr  
Step joint..... G. A. Weber  
Stereoscopic apparatus..... W. K. Dickson  
Stirrup..... H. Treas et al  
Stone dressing machine..... T. Gallagher  
Stopper extractor..... S. Clubb  
Stove air heating attachment..... D. H. Rickard  
Stove. Gas..... M. B. McCleery  
Stovepipe thimble..... J. S. Brown  
Striking bag support..... J. F. Maynard  
Surgical appliance..... L. G. Tandy  
Tack driver..... G. W. Wells  
Telegraph instrument..... M. Armstrong  
Telephone circuit..... F. W. Sorg  
Telephone system. Electric..... H. D. Currier  
Telescope..... G. Fecker  
Tent. Sanitary..... S. A. McIntyre  
Theatrical stage..... H. W. Bishop  
Thermocauter..... L. Wirsching  
Tile. Floor or wall..... L. R. Blackmore  
Tire hose coupling. Pneumatic..... C. G. Eshelman  
Tobacco cutting machine..... M. Himoff  
Tobacco prizing machine. Plug..... R. M. Vaughan  
Towel rack..... H. E. Conant  
Toy..... O. C. Hills  
Toy..... O. F. Hale  
Toy boat..... A. M. Royse  
Track gage..... A. M. Carlsen  
Track switch and block signal. Combined.....  
..... H. Hollis  
Traction increasing apparatus. Electromag-  
netic..... 2 pats..... A. A. Honey  
Train controlling apparatus. Automatic.....  
..... C. Bergmann  
Tramway. Vehicle..... W. J. Newman  
Trolley arm..... J. T. Cousins  
Truck. Automatic swing wheel car J. C. Hosher  
Truck. Railway car..... H. R. Keitaley  
Truss..... O. Tirrill et al  
Tumbling mill or barrel..... J. W. Fuller  
Tunneling..... J. C. Meem  
Turbine..... G. Zahikjanz  
Turbine. Steam..... 2 pats..... J. Stumpf  
Type writer chair..... F. I. Chichester  
Type writing machine card holding platen.....  
..... G. W. Singleton  
Type writing machine tabulating attachment.....  
..... T. Oliver  
Valve..... F. L. Waaser  
Valve..... R. A. Quin  
Valve. Automatic self balancing.....  
..... T. M. Henderson  
Valve cushioning device. Steam L. D. Lovekin  
Valve. Engine..... O. M. Carlton  
Valve for valves and fire hydrants. Automatic  
drain..... reissue..... W. W. Corey  
Valve mechanism. Air brake..... E. G. Shortt  
Valve. Pressure retaining W. H. Washington  
Valve. Water supply pipe drain..... J. J. May  
Vapor burner..... C. F. Jenkins  
Vapor burner..... J. P. Newbold  
Vegetables, &c. Machine for cleaning and  
scalding..... J. Baker  
Vehicle brake..... G. H. Bardsly  
Vehicle draft attachment..... C. E. Akers et al  
Vehicle draft attachment..... H. M. Zimmerman  
Vehicle dust guard..... N. Kutz  
Vehicle. Motor..... P. J. Collins  
Vehicle. Motor..... C. B. Titus  
Vehicle running gear..... H. L. Warner  
Vehicle running gear..... H. M. Glenn  
Vehicle top shifting rail fastener F. H. Delker  
Vessel. Life saving..... F. & B. E. Terwilliger  
Vessel shlylight..... W. B. Stearns  
Wagon brake..... C. M. McCoy  
Washing machine..... C. E. Muth  
Washing machine..... T. Gray  
Water cooled rod and piston..... J. S. Klein



Water heater. Balanced.....T. Regan  
Water purifier.....E. Delmouly  
Water tube boiler.....J. J. O'Brien  
Waterproofing and rotproofing textile fabrics.....J. Williams  
Wave energy. Utilizing.....R. A. Fessenden  
Weeder.....E. G. & A. E. Quickel  
Well bailing apparatus. Oil.....H. B. Martin  
Well construction.....M. D. Rochford  
Well derrick.....J. C. Knupp  
Well drilling machine.....G. D. Loomis  
Welt beating and inseam trimming machine.....C. L. Eaton  
Window.....W. A. Brackett  
Window.....J. Wolfensperger  
Window cleaner.....W. H. Cattle  
Window operating device.....H. W. Horst et al  
Wood strip feeding apparatus.....P. J. Joeken  
Wrench.....A. Newell  
Wrench.....H. S. Worden  
Zinc. Obtaining.....E. H. Hopkins

## DESIGNS.

Letter head or similar article.....C. P. Bruch  
Mirrors or similar articles. Back for hand.....Z. Freund  
Ornaments. Font of.....T. M. Cleland  
Plate or similar article.....A. Leger  
Show case.....C. Gantert  
Spoons or similar articles. Handle for.....E. Crees et al  
Spoons or similar articles. Handle for.....J. E. Straker, Jr  
Stone. Cut.....H. Cooper  
Tile covering for floors, walls, or other surfaces.....E. P. Leslie  
Type. Font of.....2 pats.....L. S. Ipsen  
Vessels or similar articles. Metal border for.....S. Stohr

Issued June 23, 1903.

## MECHANICAL PATENTS.

Agricultural implement seat.....J. W. Holtzmueller et al  
Air and gas mixtures. Meter for.....H. E. Oving  
Air compressor.....G. De Laval et al  
Air purifier and blower.....F. Marx  
Antiseptic. Solid soluble.....R. Koehler  
Automobile.....C. A. Bush  
Automobile power gear and brake apparatus.....T. P. Meinhard  
Axles, shafts, &c. Apparatus for making.....C. Mercader  
Baby jumper.....G. W. Wheeler  
Baling apparatus. Cotton.....J. R. Fordyce  
Baling press.....W. T. & G. P. Carr et al  
Baling presses. Apparatus for disposing of waste from.....J. G. Root et al  
Balls. Manufacturing game.....A. L. Burt  
Band cutter and feeder.....D. Ramsey  
Battery charge indicator. Secondary.....H. P. Maxim  
Battery plates. Constructing storage G. H. Gale  
Battery zinc cup. Primary.....V. G. Apple  
Bean picking machine.....J. F. Turner et al  
Bearing casting apparatus.....W. H. Tomson et al  
Bearing. Roller.....J. P. Thomas  
Bed cover holder.....F. C. Billings  
Bed. Folding.....G. W. Sanor  
Bell.....J. T. Duff  
Belt. Suspender.....L. Reiter  
Bench stop.....M. J. Wolfe  
Binder. Loose leaf.....E. L. Krag  
Binders. Needle bar for self.....T. E. Lind  
Blowpipe.....E. Johnson  
Boat outrigger.....D. R. & M. N. Sheen  
Boat structure. Submarine.....H. N. Ridgway  
Bobbin holder.....J. C. Edwards  
Bobbin holder. 2 pats.....A. E. Rhoades  
Bolt anchor.....D. M. Field  
Bolt protector.....L. B. Millhausen  
Bolts, &c. Tool for applying metal fittings for.....J. V. E. Tbiollier  
Bottle closure.....W. J. Moran  
Bottle. Non-refillable.....C. J. Gustavson  
Bottle. Non refillable.....H. F. Buttner  
Bottle. Non refillable.....R. Byers  
Bottle. Siphon.....O. Palotai  
Bottle stand.....F. Renken  
Bottle stopper.....E. J. Bennet  
Bottle stopper.....A. Lucas  
Bottle stopper or seal.....C. Schonert  
Bottles non-refillable. Cork for making.....H. Melchior  
Box fastener.....G. E. McVey  
Box machine.....2 pats.....G. R. Wyman  
Brake beam.....2 pats.....S. A. Crone  
Brake beam strut.....H. C. Buhoup  
Bread cutter.....J. S. Sackett  
Brick. Fire.....J. Ayling  
Brick, &c. Machine for making T. & W. L. Cole  
Broom rack.....R. E. Wilder  
Buckle. Cross line.....W. A. Nock et al  
Buckle. Suspender.....J. F. Molloy  
Button. Clench.....R. L. Ellery  
Button or fastener. Cuff.....F. J. Meierlender  
Caddy or cabinet. Measuring.....J. M. Kinnard  
Calculating machine.....E. Peycke et al  
Camera.....C. Bornmann  
Can body making machine.....G. F. Leiger  
Cans or other receptacles. Apparatus for filling.....S. L. Troupe  
Candy pulling machine.....W. E. Henry  
Cane loader.....L. B. Lotz  
Car annunciator. Street.....W. H. Herrick  
Car bogie. Railway.....G. H. Sheffield et al  
Car coupling.....J. E. & J. H. Stubblebine  
Car coupling.....H. F. A. Kleinschmidt  
Car draft rigging. Railway.....J. M. Waugh  
Car fender. Street.....H. P. Schneider  
Car. Freight.....A. J. Adamson  
Car grain door. Railway.....T. C. Thomas  
Car. Hopper bottom.....G. E. Russell  
Car. Self propelling automatic dumping.....V. P. Keller  
Car sign. Illuminated.....H. F. Bristol et al  
Car. Steel freight.....E. S. Eberlein  
Car. Transportation.....E. A. Trapp  
Car underframing. Railway.....J. M. Ames  
Carburetor and governor. Hydrocarbon engine.....L. T. Hagan  
Carburetor. Explosion motor.....J. Corne et al  
Carriage bodies. Umbrella receptacle for attachment to.....F. N. Young  
Carriage. Convertible baby.....H. Ysskin  
Cash register.....H. Giles  
Cash register.....J. C. Vahjen

Cattle or stock guard.....W. E. Parker  
Check controlled machines. Slot feeding mechanism for.....E. E. Jones  
Check system recorder.....J. H. McTague  
Cheese. Making.....W. Cole  
Cheese press.....I. E. Marsh  
Chronometer escapement.....J. W. Nunamaker  
Circuit breaker operating system.....W. B. Potter et al  
Clasp.....C. P. Mulder  
Cleaning and polishing device.....L. A. K. & W. Love  
Cleat for theatrical or other portable properties.....G. S. & E. A. Hall  
Clock. Electric.....O. Romanze  
Cloth folding machine.....W. H. Howard  
Clothes drier. Laundry.....W. M. Esterly et al  
Clothes drier. Laundry.....J. E. Maunen et al  
Clothes drying machine indicator apparatus.....W. M. Barnes  
Clutch and brake operating mechanism.....A. C. Hilsinger  
Clutch device. Fluid controlled friction.....T. Matson  
Clutch. Electromagnetic friction.....L. J. Le Pontois  
Clutch. Fluid controlled.....M. O. Casson  
Coaling station or storehouse for coal, &c.....F. Snare et al  
Coated plate. Bronze.....C. P. H. Ahle  
Cock. Automatic gage.....G. T. Voorhees  
Cock. Convertible stop.....C. Hirsch  
Cock for air brakes systems. Angle A. DeHodell  
Cocoa and making same. Soluble.....J. C. Haley  
Coffee pot.....H. W. Higgins  
Coke and gas. Making.....J. A. Potter  
Coke oven and gas producer.....J. A. Potter  
Coke oven discharging machine.....2 pats.....J. E. Jones  
Coke oven discharging mechanism.....J. E. Jones  
Column with ball bearing. Concrete.....H. Becher  
Commutator brush.....N. C. Bassett  
Compasses. Alidade or indicator for ships.....W. S. Burgess  
Condenser.....L. J. Le Pontois  
Condenser system.....L. R. Alberger  
Conduits. Ring bushing for interior.....W. F. Bossett et al  
Contact parts. Non-interchangeable.....R. Hundhausen  
Conveyer.....M. Schou  
Cooker. Rotary steam.....A. Johnson  
Cooking utensil.....A. H. Raymond  
Corset clasp attachment.....P. Lippmann  
Cotton chopper and cultivator.....W. D. Wilson  
Cotton chopper and plow.....T. McPherson  
Cotton press bat feeding and forming apparatus.....J. R. Fordyce  
Couch and chair. Combined.....H. H. Pattee  
Crate.....A. Vaught  
Cream separator brake.....J. W. Spencer  
Cultivator.....E. Merrill  
Cultivator attachment.....C. B. Harrison et al  
Cultivator. Revolving.....S. I. Titus  
Current regulator. Alternating.....C. C. Chesney et al  
Curtain and shade holder. Adjustable.....J. B. Casady  
Curtain holder.....L. S. Bjornstad  
Cut off for cisterns. Automatic.....C. S. Grindell  
Dental plate and making same.....H. L. Finnell  
Dental preparation for use in the operation of capping pulps.....A. L. Bower  
Directory or name board.....F. W. Leuthesser  
Disinfecting and fumigating apparatus.....J. F. Valentine  
Display rack.....L. B. Lindquist et al  
Display tray.....J. H. Smith  
Distillation of petroleum. Apparatus for continuous fractional.....W. D. Perkins  
Distilling apparatus.....W. E. Lummus  
Dock. Floating.....L. E. Clark  
Dog training device.....F. H. Erb, Jr  
Door operating and locking mechanism.....G. Gibbs et al  
Double furnace.....A. Emy  
Draft and steering device.....H. J. Eifler et al  
Draft equalizer.....H. J. Heider  
Drawer. Portfolio.....R. Bankmann  
Dredger.....F. W. Thunen et al  
Dress protector.....A. A. Dieter  
Drying furnace.....L. E. Rodgers et al  
Drying or cooling apparatus.....O. M. Hillig  
Drinking fountain.....C. H. Smith  
Driving mechanism.....F. C. Rinsche  
Duplicating machine.....A. D. Klaber  
Dye and making same. Green sulfur.....E. Culmann  
Dye. Bluish violet azo.....A. Israel et al  
Dyestuff and making same. Yellow monoazo.....W. Dollfus  
Electric brake.....E. R. Hill  
Electric heater.....W. A. Fuller  
Electric lighting apparatus.....B. G. Lamme  
Electric machinery. Dynamo H. Leitner et al  
Electric motor.....W. V. Ash  
Electric motor.....P. E. Chapman  
Electric motors. Method of and means for driving.....G. Westinghouse, Jr  
Electric motors. Operating alternating current.....R. Eickemeyer  
Electric switch.....C. F. Splittorf  
Electrical cut out. Automatic.....D. R. Bruce  
Electrode.....J. Hargreaves et al  
Electromagnet.....W. Baxter, Jr  
Electrostatic instrument.....E. J. King  
End gate fastener.....W. H. Bailey  
Engine.....W. R. Haney  
Engine body. Hydrocarbon traction.....F. A. & H. F. Klocksiem  
Engine coupling. Traction.....W. H. Putnam  
Engine igniter. Explosive.....T. B. Jeffery  
Engraving machine. Pantograph.....M. Barr  
Exhaust head.....G. I. Roberts  
Exhibitor. Curtain.....P. J. & H. Roush  
Explosion engine.....K. Schafferkotter  
Extinguisher.....J. H. Simpson  
Fabric stretching rollers.....W. Birch  
Fat from entrails. Machine for removing.....J. Boes  
Faucet.....E. L. Walter  
Feather tip or plume.....E. M. Moch  
Feed trough.....C. Baker  
Feed water heater and purifier.....C. E. Tudor et al  
Felt picker.....W. J. Bell  
Fence post.....V. E. Randall  
Fence post.....E. L. & W. H. Cadwell  
Fence top. Barbed wire.....F. D. Green  
Fertilizers. Producing.....A. K. Jarecki  
File cutting machine.....M. Merk

Files. Adjustable post for binder.....W. H. Kell  
Films. Producing metalline.....A. Huck et al  
Filter.....A. Fischer  
Fire apparatus.....E. F. Steck  
Fire box.....J. Greave  
Fire escape. Portable.....L. E. Quin  
Fire flue boiler.....D. L. Shaffer  
Fireproof window. Automatic.....F. Voigtman et al  
Fly trap.....2 pats.....H. A. Bierley  
Forceps. Upper cuspid.....F. S. Manning  
Forging rock drills.....W. W. Word  
Friction brake.....R. R. Osgood  
Friction mechanism.....P. C. Wilson et al  
Fruit assorting machine.....J. J. White  
Fruit press.....G. J. Fanner  
Fumigating tent.....W. H. Payne  
Furnace door opener.....J. E. Swanson  
Fuse for exploding shells. Impact.....K. Wieser  
Game.....R. S. Bradbury  
Game apparatus.....G. T. Voorhees  
Game apparatus.....A. Strahle  
Game board. Wicket.....C. J. Dorsey  
Gas apparatus dip pipe.....C. R. Faben, Jr  
Gas burner.....J. H. Diehl et al  
Gas burner. Acetylene.....P. & C. Jacob  
Gas burner guard.....G. Schulz  
Gas burner mantle support.....H. J. Siegel  
Gas engine.....C. Rossler  
Gas. Generating acetylene.....G. J. Atkins  
Gas generating apparatus.....G. C. Otten  
Gas igniter. Automatic.....J. Jurgens  
Gas manufacturing apparatus.....G. Cotheran  
Gas regulator.....A. M. Fisher  
Gastroscope.....P. Poirier et al  
Gate.....G. E. Slater  
Gate pattern.....F. H. Arnold  
Gearing.....M. F. Rondet  
Gearing for motor driven tools.....A. Porterfield  
Gearing. Worm.....F. C. Wagner  
Gin. Roller.....L. L. Foss  
Gin system. Grabot.....S. Castleman  
Glass or other materials. Bar for holding together portions or sheets of.....R. H. Raphael  
Glass ornamenting machine.....J. M. Conroy  
Glassware manufacturing machine.....J. F. Gegenheimer  
Glove.....A. G. Hoegren  
Glove. Bottler's.....J. Krifka  
Gold or silver from slimes. Extracting.....J. T. Terry, Jr  
Golf ball.....R. Reach et al  
Golf ball.....C. T. Thompson  
Governor. Explosive engine.....E. Uhlin  
Grease, &c. Composition for removing.....H. D. Sudmore  
Gun ejector. Breech loading.....G. A. Horne  
Gun pivot locking device.....G. Ehrhardt  
Gun sight lighting device.....H. Schlaegel  
Hair crimper.....M. I. Connell  
Hair supporter.....H. A. Johnston  
Hair waver.....A. Drees  
Harness loop.....J. H. R. Hauck et al  
Harrow. Riding.....A. T. Upton  
Harvester.....F. L. Kincaid  
Harvester and husker. Corn.....F. H. Pierce  
Harvester butter.....J. J. Wiseman  
Harvester. Corn.....W. Smoley  
Hat holder.....S. Hecht  
Hat shape retainer.....C. T. Naftel  
Hay carrier.....H. L. Ferris  
Hay press.....J. Eutsler  
Headlight support and adjusting mechanism therefor.....S. McConnell  
Heating device.....A. & H. Leibold  
Heating system. Steam.....T. S. Hamilton  
Heel attaching machine.....W. E. Searles  
Hinge.....H. H. Pattee  
Hitching device. Horse.....H. Dalwigk  
Hitching or releasing device. Horse.....H. C. Graybill  
Honeycomb stripper.....A. C. Miller  
Hook.....A. R. Otterman  
Horseshoe.....A. Clawson  
Horseshoe.....J. Regan  
Hose nozzle.....E. H. White  
Hot bearing indicator.....J. R. Markle  
Hub. Metal wheel.....E. R. Wagner  
Hydrocarbon supply tank.....G. B. Landers  
Hydrocarbon vapor burner.....A. B. Macklin  
Ice cream brick mold.....J. J. Suigo  
Ice cream packing can.....J. J. Suigo  
Incubator.....W. N. Yeager  
Indexing mechanism.....F. G. Echols  
Indexing mechanism. Friction.....F. G. Echols  
Indicating the relative positions of moving parts.....2 pats.....H. W. Buck  
Induction coil.....J. Splittorf  
Inhaler. Nasal.....C. K. Teter  
Internal combustion engine.....A. T. Collier  
Jar clamp.....E. J. Kraetzer  
Jar closure.....J. Kunkel  
Journal bearing.....J. Tobin  
Journal boxes. Lock for bearing pieces of.....G. W. Lewis  
Journal brass and saddle.....J. C. Wands  
Knitting machine attachment.....E. A. & A. M. Pigeon  
Lamp.....C. Johnson  
Lamp. Acetylene search.....A. J. Murdock et al  
Lamp. Electric arc.....J. A. Rignon  
Lamp support. Incandescent electric.....F. W. Winbolt  
Latch. Locking.....L. W. Hall  
Lawn rake.....G. W. Anderson  
Leather skiving and folding machine.....F. L. Harmon  
Letter carrier's routing table and filing case.....C. C. Fields  
Lifting jack.....E. T. Ogle  
Liquid distributing system.....F. C. Birch  
Lock.....J. Krajicek  
Lock washer.....J. McGraw, Jr  
Log car.....W. S. Kennedy  
Loom cam. Bag.....H. Bradleys  
Loom shuttle box operating mechanism.....A. Barbier  
Loom wiring motion.....E. Hollingworth  
Looms. Means for preventing warp breakage in.....C. F. Roper  
Lorgnette and opera glass. Combined.....W. E. Stevens  
Lubricator.....2 pats.....E. Allen et al  
Magnetic separator.....A. E. Forsgren  
Mail bag catching and delivering mechanism.....R. J. Meyer  
Mail box.....A. R. McClelland  
Mantle and smoke bell support.....H. J. Siegel  
Manure spreader.....T. Brown  
Massage instrument.....J. H. & C. Carpenter

Massage roller.....T. Lennox  
Match box.....F. K. Kennedy  
Mattress. Bed or couch.....J. Hoey  
Mattress. Woven wire.....G. H. Buck  
Measuring and marking fabrics, &c. Machine for.....A. Monfort  
Measuring and registering device for liquid supply tanks.....J. G. Williams  
Mechanical movement.....J. & F. Kloboucnik  
Melting furnace.....W. J. Brown  
Metal sheets. Manufacturing thin.....T. V. Allis  
Metal working machine.....F. G. Johnson  
Metallic tie and rail fastener.....J. Fraser  
Milling machine automatic return feed.....C. Hakes et al  
Miter box.....2 pats.....J. Larson  
Molding machine operating lever.....F. J. Stratton  
Mop wringer and brush.....L. D. Hart  
Motor mechanism.....F. F. Echols  
Motors. Controlling alternating current.....P. J. M. Girault  
Mower reaping attachment.....E. A. Johnston  
Mowers, reapers, &c. Spring clip for cutting apparatus of.....J. W. Pridmore  
Music leaf turner.....W. A. Mercer  
Musical instrument.....E. P. Cowles  
Nail and coating therefor.....R. Mattice  
Nail feeding device.....C. P. A. Janssen  
Nail, spike, &c.....C. Haas  
Nailing machine.....H. W. Morgan  
Neck dressing for women.....E. B. Ashmore  
Nut lock.....W. Brotherton  
Oil burner.....J. F. Ruple  
Oils from seeds. Expressing.....V. D. Anderson  
Ore milling apparatus.....G. R. Tuttle  
Ore, &c. Separating machine for D. S. Decker  
Ore separator.....T. J. Reid  
Ore separator. Magnetic.....K. V. A. Eriksson  
Ores for other uses. Apparatus for sizing.....S. R. Swain  
Ores or tailings with solutions of alkaline cyanides. Leaching.....C. W. Merrill  
Organ. Reed.....R. Essig  
Packing.....S. Hughes et al  
Paint compound.....E. Bennett  
Paints, colors, dyes, or similar goods. Device or means for exhibiting and advertising.....I. W. Drummond  
Paper box. Foldable.....H. Lowy  
Paper cutting and folding machine.....S. D. Ruth  
Paper fastener.....J. V. Washburne  
Paper reed.....2 pats.....F. J. Shaw  
Pen feeder. Fountain.....J. Weeks  
Pen. Fountain.....H. F. Buttner  
Petroleum blue burner.....H. Hurwitz et al  
Photographic bath apparatus.....C. S. L. Kennedy  
Piano or organ player. Mechanical.....W. F. Bayer  
Picture. Embossed.....A. Berninger  
Pile fabric. Woven.....R. S. & H. Cookson  
Pipe coupling.....H. W. Bradley et al  
Plant support.....E. C. Sherman  
Planter. Corn.....R. O. Newell  
Planter. Corn.....R. V. Barry  
Planter, cotton chopper, and cultivator. Combined.....J. D. McKenzie  
Planter disk furrow opener or closer. Seed.....F. W. Wilson  
Pliers.....E. E. Kleinschmidt  
Plow bar and regulating lever.....J. L. Horton et al  
Plow. Disk.....J. A. Creager  
Plow harrow attachment.....J. C. Fooshe  
Pocket. Garment.....J. D. Wentworth  
Poke. Animal.....J. E. McManahan  
Portable seat.....J. W. Czernak et al  
Powder. Apparatus for inflaming rock.....J. Reinelt et al  
Power and brake system. Combined.....W. B. Potter et al  
Power transmission mechanism.....J. D. Ring  
Power transmitting mechanism. Means for supporting.....L. J. Le Pontois  
Precious metals from solutions. Sulfuric acid process of extracting.....G. A. Bahn  
Press.....3 pats.....V. D. Anderson  
Pressure gage.....C. J. Manning  
Printing apparatus. Yarn.....C. L. Horack  
Printing press.....G. W. Prouty  
Printing press.....H. A. W. Wood  
Printing press.....J. Krehbiel  
Printing press.....J. F. Ames  
Propeller shafts. Apparatus for regulating the speed of.....T. A. Duiff  
Propelling mechanism. Boat M. N. D. R. Sheen  
Pulley.....J. T. Duff  
Pump.....J. T. Duff  
Pump.....L. J. Russell  
Pump. Double acting.....S. N. Hall  
Pump. Double acting.....S. N. Hall  
Pumping engine. Direct acting.....W. May  
Push button.....A. Lungen  
Puzzle. Thimble.....H. Schierhorst  
Rail switch. Traction.....H. & H. Williams  
Rails. Means for preventing the spreading of.....M. Sellers  
Railway brake.....P. Hallot  
Railway construction.....S. E. Duff  
Railway rail joint.....H. T. Lockwood  
Railway rail joint.....J. C. Wallace  
Railway rail joint.....C. G. Polleys  
Railway. Ship.....O. Philipp  
Railway switch. Street.....J. E. Scott  
Railway switches. Device for operating street.....E. Robbins  
Railway transfer table.....A. Nelson et al  
Railway vehicle lighting apparatus.....B. G. Lamme  
Reaper or mower rake attachment.....G. Haenstein  
Receptacle closure.....J. A. Landsberger  
Receptacle stopper.....C. A. Tatum  
Reclining chair.....F. C. Hodges  
Refrigerating apparatus.....E. W. Millburn  
Refrigerating machines. Device for preventing vapor from passing the expansion valves of.....G. T. Voorhees  
Regulator disk.....H. S. Sheer  
Rifle range.....J. de St. Legier et al  
Rivet holder. Pneumatic.....E. Gunnell  
Rock drill shaping and sharpening apparatus.....W. W. Word  
Rock drilling machine.....J. G. Heimrich  
Rolling press.....W. S. Gillen et al  
Rotary engine.....C. T. Benson  
Rowing machine.....L. W. Grayson  
Sack holder.....E. E. Elliott  
Salt graining apparatus.....J. S. Clarke  
Sand blast.....J. Perdue  
Sash. Window.....A. L. Bolles



Saw jointer.....E. J. Hicks  
Saw jointer and gage. Combined.....R. E. Poindexter  
Saw set.....H. Cottrell  
Saw setting machine.....B. F. Briley  
Scale.....M. Schwartz  
Scale. Weighing.....N. Newman  
Seed huller. Cotton.....F. A. Wells  
Seeder.....J. L. Jones et al  
Serving apparatus.....T. H. Munroe  
Sewing cabinet.....A. E. Thayer  
Sewing machine. Blindstitch.....3 pats.....J. G. Lewis

Sewing machine. Boot or shoe.....F. Doucet  
Shade bracket. Window.....A. Brzykcy  
Shade. Window.....A. R. Hagner  
Shaft clamp.....H. C. Swan  
Shaft coupling.....J. E. & R. P. Vaudegrift et al  
Shaft coupling. Flexible.....A. Peteler  
Shaft end. Vehicle.....J. Sigrist  
Shaping machine.....A. Kimble  
Shaving apparatus.....F. J. Halbekann  
Shears attachment.....W. Kanter  
Ship derrick.....D. F. MacDonald  
Ship's state room.....J. W. Boughton  
Shock or hay loader.....J. E. Little et al  
Shoe.....P. Yon  
Shoe holder.....W. R. Patterson  
Show card.....H. H. Garrison  
Shuttle.....E. L. Castor  
Sidewalk. Concrete steel.....W. Mueser  
Sieve or bolting machine. Gyrating.....A. Wolf  
Sifter. Flour.....G. W. Hancock  
Signs. Making.....C. Blossom et al  
Silk reel. High speed.....E. Fougereol  
Sled.....W. A. Marqua  
Slicing machine.....E. F. Smith  
Smoke consuming furnace.....W. K. Clark et al  
Snap. Harness.....W. P. Morrow  
Sodium oxid. Making.....A. Bischoer  
Soldering iron. Electric.....J. J. Ayer  
Soldering machine. Can.....G. F. Leiger  
Soldering machine. Can body.....G. F. Leiger  
Sole and heel protecting device for boots, shoes, &c.....J. T. Sutcliffe  
Spark arrester.....J. T. Hawkins  
Spectacles. Temple for.....C. A. Zeiser  
Speed changer.....C. F. Roper  
Speed changing apparatus. Electrically controlled.....2 pats.....L. J. Le Pontois  
Speed changing mechanism. Electrically controlled.....L. J. Le Pontois  
Spreading roll.....D. H. Lentz  
Spring clip.....G. W. McGill  
Spring clip for holding papers, &c.....G. W. McGill  
Stack former. Straw.....D. Cook  
Stamp shoes or dies. Making.....W. Brinton  
Staple machine.....R. K. Marple  
Staple machine.....E. A. Suverkrop et al  
Stay bolt.....S. M. Vauclair  
Steam boiler.....R. W. Barton  
Steam engine. Low speed.....G. P. Clark  
Steam separator.....G. I. Roberts  
Steam trap.....M. W. Cottle  
Steel. Toughening manganese R. A. Hadfield  
Stereotyping.....W. Nicholas  
Stone breaker.....E. Deane  
Stone conveyer. Artificial.....N. F. Palmer  
Stone. Manufacturing artificial.....W. Owen  
Stone removing apparatus.....J. P. Moran  
Storage battery.....C. Bruno  
Storage structure.....2 pats.....A. H. Woodward  
Stove. Heating.....D. Lippy  
Stove hood.....M. Warren  
Stove. Lamp.....A. S. Martin  
Stovepipe.....D. N. Thomason  
Stoves. Air valve for hot blast G. K. Hamfeldt  
Strainer. Milk.....C. A. Dunn  
Strainer. Tea or coffee.....A. H. Leach  
Streets, roads, or footpaths. Implement for clearing.....F. Draeger  
Sulfuric anhydrid. Apparatus for making.....C. Daub  
Supporting and attaching device. Combined.....C. Johnson  
Switchboard.....J. F. Skirrow  
T-bars, angle bars, &c. Machine for straightening.....G. H. Geyer  
Tap.....P. J. Kelly  
Teeth. Porcelain crown for.....W. H. Mosley  
Telephone notation register.....J. P. McKee  
Telephonic toll collecting devices. Electrical indicator for.....R. B. Hazlett  
Telephoning apparatus.....J. R. Troland  
Tenpin centering and leveling device.....C. H. Gunn  
Testing apparatus.....G. J. Henry, Jr  
Thermoset.....A. Roesch  
Thill coupling.....E. Trainer  
Thread dressing machines. Twisting head for.....G. A. Fredenburgh  
Ticket case.....M. Macdonald  
Tickets. Machine for dating and numbering mileage.....W. H. Ogan  
Tidal elevator.....C. D. O'Leary  
Timepiece regulator.....C. C. Sibley  
Tincture extractor.....H. Redlich  
Tire. Rubber.....C. Grotz  
Tongs. Grappling.....R. E. Lackner  
Tool. Combination.....W. R. Clark  
Tool. Combination.....J. Koegel  
Tools. Machine for relieving fluted.....F. G. Echois  
Torch.....W. J. Hackett  
Toy. Chance.....C. J. Dorsey  
Track switch. Elevated.....H. H. Drew  
Treadle power.....J. J. Cook  
Trestle. Adjustable.....L. G. Cantrell  
Tripod.....W. F. Folmer  
Trolley finder.....G. T. Roberts  
Trolley pole controller.....J. J. O'Donnell  
Trucks. Brake rigging for six wheeled.....3 pats.....F. P. Livingston  
Truss.....J. Rallion  
Twine or cord. Ball or cop of.....J. Good  
Type justifying means.....C. H. Cochrane  
Type writing machine.....H. J. Halle  
Type writing machine.....F. F. Anderson  
Type writing machine adding attachment.....A. C. Schuman  
Type writing machine printing or type bar mechanism.....F. X. Wagner  
Universal joint.....A. Poidatz  
Valve. Dry pipe.....P. Evans  
Valve. Fluid controlling.....G. C. Savage  
Valve motion.....P. L'Orange  
Valve. Rotating steam or water.....H. E. Parson  
Valve. Steam feed.....W. C. Trout  
Varnish composition. Quick.....G. Tuschel

Vegetable crusher.....M. Warren  
Vehicle box corner fastening.....E. L. Phipps  
Vehicle brake. Motor road.....F. Charron et al  
Vehicle. Motor road.....N. Cernatesco  
Vehicle rack. Rubber tired.....J. J. Allen  
Vehicle running gear.....G. H. Condict  
Vehicle running gear.....R. A. Moore  
Vehicle steering gear.....J. L. McDowell  
Vending machine.....C. M. Mitchell  
Vise. Bench.....D. L. Smith  
Wagon body.....C. W. Behrens  
Washing machine.....R. J. Bailey  
Watch. Stem winding.....E. Koehn  
Water. Apparatus for softening or otherwise chemically treating, filtering and storing.....F. B. Leopold  
Water heater.....T. E. Leach  
Water heater, food warmer, and drying rack. Combined.....C. H. Asling  
Water motor.....C. A. Arnsberger  
Water purifying and softening apparatus.....S. H. Hodgkin  
Water towers or the like. Automatic pneumatic balance for.....H. H. Gorter  
Water wheels. Water nozzle for impact.....G. J. Henry, Jr  
Wave motor.....W. S. Jacobs  
Weaning device. Calif.....A. N. Bender  
Weft fork mechanism.....A. Dube  
Weighing machine. Automatic.....S. S. Blaisdell  
Weighing machine. Coin operated.....G. E. Van Guysling et al  
Welding machine.....C. H. Clayton  
Well lining.....J. W. Beaumont  
Wheel.....W. P. Yancey  
Wheel tensioning device.....S. B. Whiteside  
Whiffletree.....C. T. Stephens  
Windmill attachment.....J. P. Muller  
Winder. Thread.....M. V. Palmer  
Window.....T. Sulikx  
Window frame and sash.....J. C. McMahon  
Wrench.....C. F. Folsom  
Wrench for cylinder teeth.....W. H. George  
X-ray tube shield.....R. Friedlander

## DESIGNS.

Bottle.....C. B. Garwood  
Bracket. Window shelf.....W. H. Kohr  
Brushes or similar articles. Back for.....O. Leigh  
Chandeller trimming.....E. Gotthberg

Issued June 30, 1903.

## MECHANICAL PATENTS.

Accounts. Means for checking separate.....H. D. Bristol  
Acetylene burner.....H. E. Shaffer  
Acid or other gas. Apparatus for charging fluids or the like with carbonic G. A. Lowry  
Agricultural implements. Steering truck for.....F. R. Packham  
Air pipe moisture and rust trap.....J. S. Bridges  
Alarm lock.....W. Edwards  
Amusement device.....J. J. McCormick et al  
Amusement device.....C. A. Needham  
Armature.....J. A. Little  
Ash shovel and sifter. Combined C. F. Belknap  
Asymmetric conductor.....C. Hambueschen  
Atomizer.....C. A. Tatum  
Auger. Expandable.....W. I. Wheeler et al  
Automobile chain boot.....C. G. Fisher  
Baby jumper bracket.....E. C. Smith  
Bags, bales, &c. Tie for.....W. J. Beardsley  
Baling press.....J. S. Moore  
Ball.....K. V. Painter  
Ball and socket fastener. Wire.....J. D. Stierckler  
Basin plug. Adjustable metal.....W. F. Schultzeiss  
Bath tub seat.....W. & T. Wolpert  
Bearing. Detachable shaft.....S. C. Davidson  
Bearing. Roller.....J. A. Perkins  
Bed.....M. V. Hammack  
Bed bottom.....J. Ranz  
Bed bottom. Spring.....C. D. Brouette  
Bedstead fastening.....A. Strobel  
Bedstead. Metallic.....M. J. Casey  
Beehive frame.....H. Vogeler  
Belt. Apparel.....R. Fischman  
Belt shifter.....E. P. Hayes  
Belt strap.....J. M. Gitterman  
Binder knotter protector.....F. B. Stout  
Blind opening or closing device.....N. O. Bond  
Blind operating device.....N. O. Bond  
Boiler covering and making same H. C. Michell  
Boiler fire box.....W. H. Laughridge  
Boiler furnace.....J. J. Leach  
Boiler safety appliance. Steam.....J. Beiser  
Boiler superheater. Steam.....reissue  
Bolster.....J. P. Snelton  
Book cover protector.....G. G. Floyd  
Book. Manifold sales.....E. P. Cushman  
Boots and overshoes. therefor. Protector and snow excluder for felt.....S. W. Wehn et al  
Bottle detector. Refilled.....H. V. Scott  
Bottle filling, corking, and labeling.....S. Fyfe  
Bottle filling machine.....N. Glab  
Bottle. Non refillable.....L. F. Bizouarne et al  
Bottle. Siphon.....W. H. Birchmore  
Bottle tin foiling machine.....J. F. Schneider  
Bottling apparatus.....E. E. Ford  
Bottling machine.....A. Schneider  
Bowling alley.....R. Reisky  
Box.....A. Bauer  
Box making machine.....F. M. Wade  
Brake apparatus. Fluid pressure.....J. Reichmann  
Brew house apparatus equipment.....M. Henius  
Brick machine transferring device.....A. F. Potvin  
Broom and dusting utensil holder W. F. Rocole  
Brush holder.....A. Churchwood  
Brush holder.....L. E. Underwood  
Buckle.....J. E. Mitchell  
Building block. Hollow concrete.....F. S. Appleman et al  
Burner.....M. L. Ross  
Burner.....R. M. Shaffer  
Button setting machine.....F. E. Stanley  
Cabinet. Automatic lift and drop W. S. Carlisle  
Calculator.....B. B. Holmes  
Calendering machine folding attachment.....M. Vewgarden  
Calipers and dividers.....N. Stoddard

Camera shutter.....V. & K. F. Conley  
Cans for shipment. Preparing D. Cameron et al  
Canning foods.....A. T. Jones  
Cane. Magazine torpedo.....J. H. Rese  
Car brake.....A. Christensen  
Car brake attachment.....G. E. Terpe  
Car brake. Emergency.....W. B. & V. Storch  
Car bunter. Electric.....J. Brennan  
Car center sill. Railway.....O. S. Pulliam  
Car construction.....C. W. Mourer  
Car coupling.....O. S. Pulliam  
Car coupling.....W. L. Kendall  
Car door. Grain.....S. A. Vickers  
Car draw gear. Railway.....J. F. Courson  
Car. Dumping.....A. D. Harrison  
Car guard rail. Freight.....W. Harrison  
Car. Railway.....F. H. Rapley  
Car window antifrosting attachment.....A. Le Blanc

Continued in August number.

**FREE!** Send us 2 cents to pay for postage and we will mail you a valuable copyrighted book, "How to obtain Patent, Caveat, Trade-Mark and Copyright Protection, with Decisions in Leading Patent Cases" entirely free of charge. Address: **INVENTIVE AGE PUBLISHING COMPANY,** (Dept. P.) **WASHINGTON, D. C.**

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

Foreign patents may also be obtained in certain other countries.

## Attention Inventors!

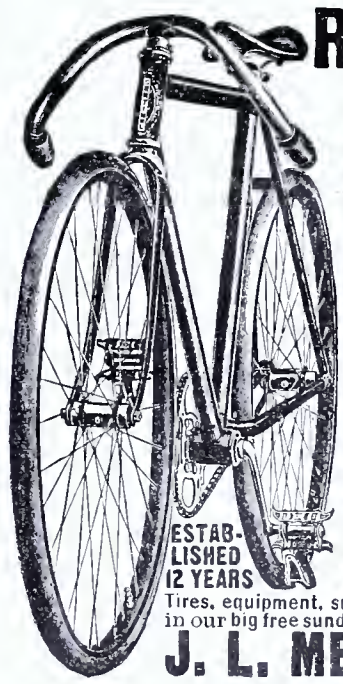
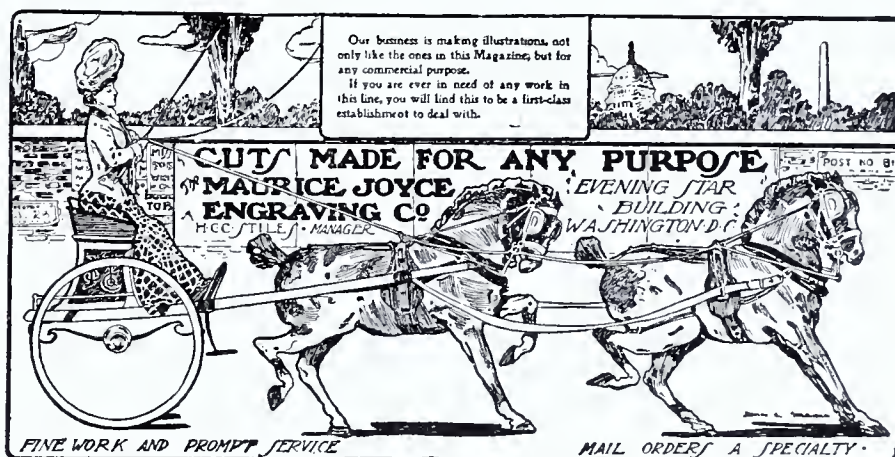
## LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

Charge one dollar.

In ordering, please state specifically the class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.



## RIDER AGENTS WANTED

in each town to take orders for our new High Grade Guaranteed Bicycles.

## New 1903 Models

"Bellise," Complete \$8.75  
"Cossack," Guaranteed High Grade \$10.75  
"Siberian," A Beauty \$12.75  
"Neudorf," Road Racer \$14.75

no better bicycle at any price.

Any other make or model you want at one-third usual price. Choice of any standard tires and best equipment on all our bicycles. Strongest guarantee.

We **SHIP ON APPROVAL** C. O. D. to any one without a cent deposit and allow **10 DAYS FREE TRIAL** before purchase is binding.

**500 Second Hand Wheels \$3 to \$8** taken in trade by our Chicago retail stores, all makes and models, good as new.

**DO NOT BUY** a bicycle until you have written for our Tires, equipment, sundries and sporting goods of all kinds, at half regular price, in our big free sundry catalog. Contains a world of useful information. Write for it.

**J. L. MEAD CYCLE CO., Chicago, Ill.**

## The Manhattan Typewriter,

Guaranteed to be of the Highest Grade.

NOT IN THE TRUST. PRICE \$50.

JOHN C. PARKER,

619 Seventh St. N.W., Washington, D. C.

E. C. WILEY,

Mechanical - - -

- - - Engineer,

Office 811-1-2 Main Street,

Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.



AN ELEGANT REPRODUCTION OF A CHARMING

# \$75,000.00 Painting

Given Away



REDUCED ILLUSTRATION

"THE VILLAGE WEDDING"

FULL SIZE 25 BY 38 INCHES

FOR several years the publishers of the WOMAN'S HOME COMPANION have been searching for something, to give to their subscribers, that would ECLIPSE ANYTHING EVER OFFERED BY ANY PUBLISHING-HOUSE IN THE WORLD. At last, at great expense, they are able to make it possible for every home in America to possess a magnificent and faithful reproduction of one of the most remarkable paintings ever produced by mortal man in this or any other age. It secured for the artist the honor of immediate admission to the ranks of the Royal Academy. The original painting was shown all over Europe, and thousands upon thousands of people gazed upon it with rapture. It was quickly bought up for \$75,000.00, and placed in the position of honor in one of the most celebrated galleries in Europe, and no American money yet offered has been able to secure it for this country. The whole picture fascinates one with its absolute accuracy to life. Every figure in itself alone is a study that would make a wonderful picture. Every face is alive with the spirit of action. It is a picture of mirth and merriment; a picture to bring sunshine into every home and the heart of every one who gazes upon it. You cannot tell our engraving from the only other authorized reproduction, which sells in Europe for \$18.00 (eighteen dollars). Our exquisite reproduction is 25 by 38 inches, including margin, the exact size of the costly European engraving, and will be a splendid addition to the art collection of any home, whether framed or hung without framing, a fashion now so much in vogue.

**WOMAN'S HOME COMPANION** This magazine is edited and made up in the city of New York, the leading literary and art center of America. It contains the most timely illustrated articles, the most beautiful illustrations, the best short stories, the most popular serial stories, the most practical household departments, the best of everything desirable for a home magazine. It is printed on the finest paper, has 44 to 60 large pages, 11 by 16 inches. The twelve numbers will contain more than one thousand beautiful illustrations. Each month it carries a message of help, profit, pleasure, education, culture and refinement to over two million readers. Its editors and contributors are the most popular American writers. It is altogether the cleanest, brightest, handsomest, choicest and best of American home magazines.

**\$7.00 for \$1.85**

"THE VILLAGE WEDDING,"	very, very cheap at \$5.00	A total value of \$7.00
WOMAN'S HOME COMPANION	one year, price 1.00	
INVENTIVE AGE & PATENT	one year, price 1.00	
= = INDEX = =		

**BOTH PAPERS ONE YEAR AND THIS PICTURE SENT TO ANY ADDRESS**

**For Only \$1.85**

In this offer, although paying less than the ordinary and regular price of the papers for a year, you get in addition the above-described charming picture ENTIRELY FREE.

The papers and picture in the above offer can go to different addresses.

THE ABOVE OFFER APPLIES TO OLD OR NEW SUBSCRIPTIONS.

SEND ALL ORDERS TO

**INVENTIVE AGE PUBLISHING COMPANY.**  
WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

# THE Inventive Edge

AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR, }  
No. 8.

WASHINGTON, D. C.--AUGUST, 1903.

} SINGLE COPIES 10 CENTS.  
} ONE DOLLAR A YEAR.

- - - LOUISIANA PURCHASE EXPOSITION - - -

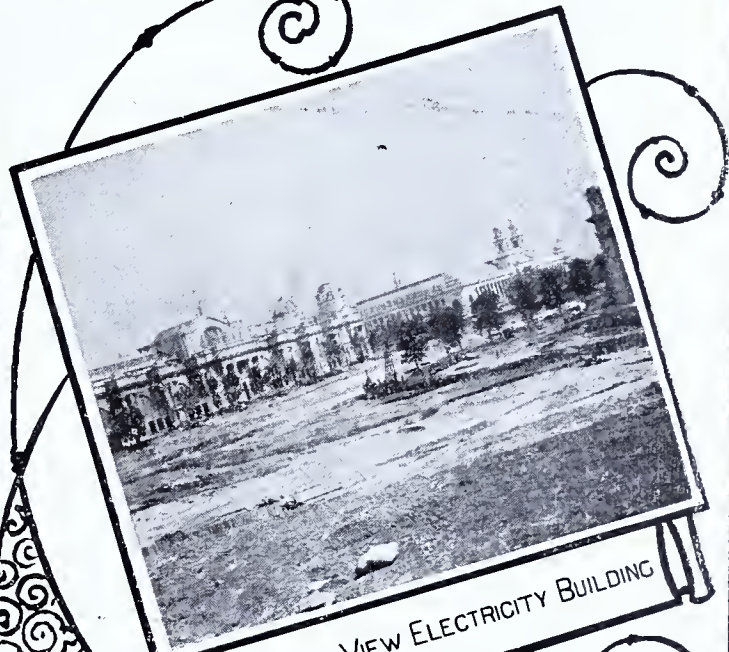
1904.



SOUTHERN SIDE OF VARIED INDUSTRIES BLDG.



HALL OF CONGRESSES



GENERAL VIEW ELECTRICITY BUILDING



S.E. CORNER OF VARIED INDUSTRIES BLDG.



VARIED INDUSTRIES BLDG



ELECTRICITY BLDG

VIEWS SHOWING A FEW OF THE BUILDINGS IN THE COURSE OF ERECTION AT ST. LOUIS, MO.



## TAR-MACADAM ROADWAYS.

GOOD roads are the demand of the day, not only in cities, but also for country highways. The cost of roads of asphalt or brick puts them out of the question, save in the larger towns and cities. The old style of macadam road is impracticable in many of the Western States, because

After four years of hard usage, without a dollar being spent for repairs, that block of road is almost as smooth and in as good condition as when first made. The cost of construction was 68 cents per square yard. Two blocks on a business street, much used for heavy teaming, which were laid by the

constant expense to keep in repair. Judging from experience, and with the latest methods of combining the material, a tar-macadam road will give good service for at least ten years, and it can then be resurfaced at a cost not exceeding 25 cents per square yard. The tar-macadam road is almost as noiseless as asphalt, and is easier on horses, with less jar and no danger from slipping in rainy weather. Another advantage is that it is almost dustless.

was decided to replace the whole of this pavement with tar-macadam.

During the years 1899, 1900, and 1901, 8.68 miles of tar-macadam was laid at a total cost of \$145,061.

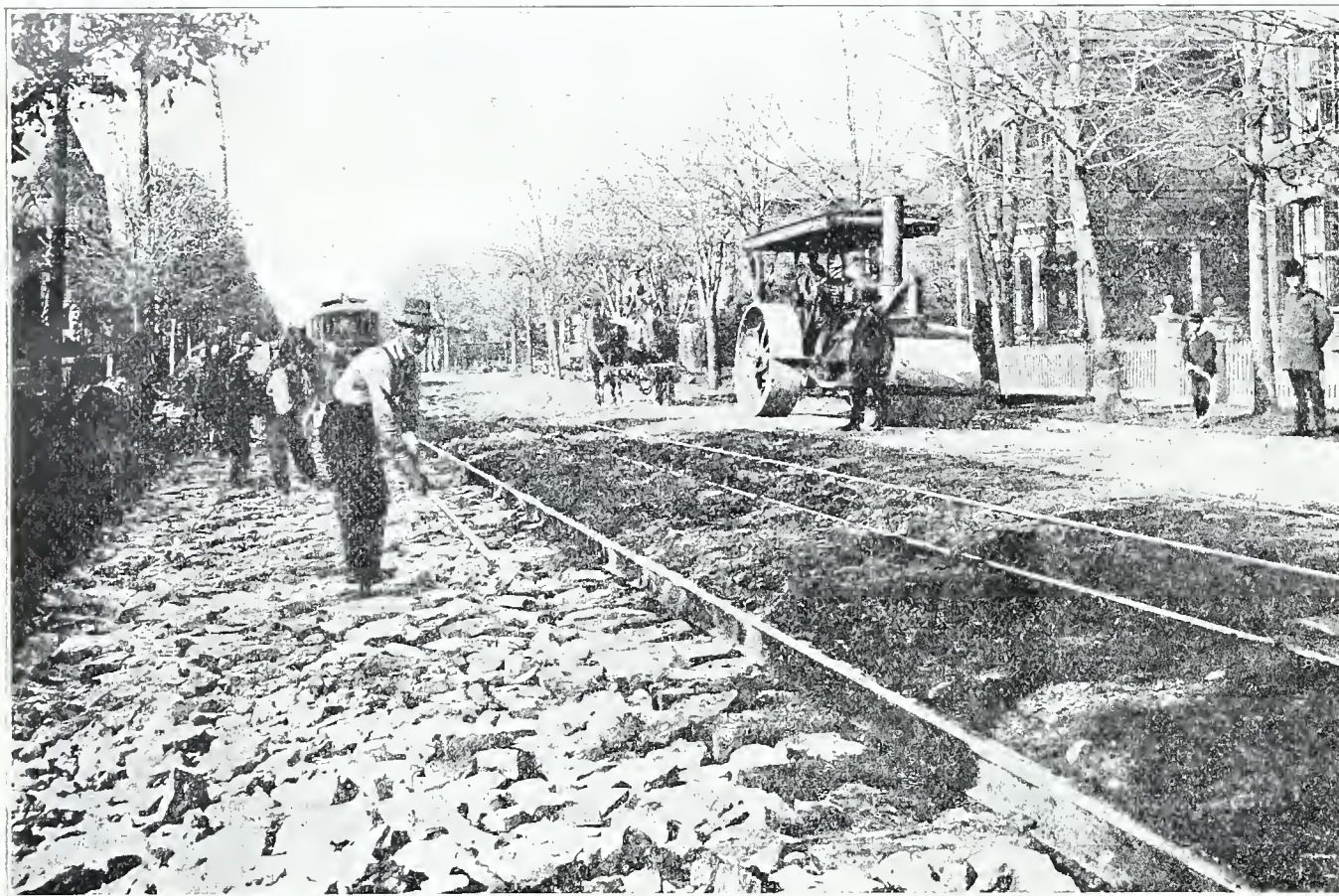
The method of construction has been frequently asked for, and for the benefit of those interested may be briefly stated as follows, viz:

The cedar blocks composing the old pavement were removed. The blocks being 10 inches deep, it was necessary to remove 2 inches of the sand foundation underneath the blocks to allow of the full depth of 12 inches of tar-macadam to be placed, so as to leave the curb in the same relative position with the finished surface of the roadway as before.

The subgrade was then rolled with a 15-ton roller, and any soft spots revealed were filled up and rolled until the whole surface had been worked to the proper grade and cross section, care being taken to keep the subgrade, as also each succeeding layer of materials, parallel with the finished cross section of the roadway.

The bottom course or stone foundation, 6 inches in depth, was next put in place. This consisted of stone varying from 6 inches to 12 inches laid roughly by hand on their natural or flat beds, after which stones of a smaller size were put on top and broken roughly in place, so that all the larger voids in the foundation stones were filled. The course was then rolled similar to the sub-grade, care being taken, as before stated, to keep the cross section true.

The broken stone was now brought to the work and the process of tarring was gone through with as follows: Tar kettles, in which the tar was kept at the workable temperature and consistency, were placed conveniently to mixing boards similar to those used in mixing concrete.



of the scarcity of stone and the cost of transportation: and where roads are surfaced with broken stone the material disappears in the mud of the prairies.

The tar-macadam roadways which have been put down in Hamilton, Canada, have attracted much attention and are deserving of special mention.

A tar-macadam roadway has two advantages: the cost is from one-third to one-half that of asphalt or vitrified brick, and it is more enduring than either.

Twenty-two years ago a part of a street in Hamilton was laid with tar-macadam, as an experiment, by the gas company. It is used by teamsters in hauling heavy loads of merchandise from the railway. The manner of doing the work was crude in comparison with present-day methods, and little labor or money has been expended in keeping it in repair, yet that street is in good condition. Four years ago a block in the business center of the city was selected in which to experiment with the newer methods of combining stone and tar in road work. It is a block where heavy teaming is done, the largest wholesale iron and hardware store in the city fronting on it.

gas company some ten or twelve years ago, have recently been resurfaced at 25 cents per square yard no repairs having been made up to that time.

The City Engineer's report is as follows:

The city of Hamilton having laid about 8 miles of cedar block pavement



The asphalt pavements put down in Hamilton eight years ago cost more than twice as much as tar-macadam to construct and have involved almost

in 1885: and this pavement having rapidly deteriorated, until in the year 1899 it became impossible to draw an ordinary load over it with safety, it

The stone to be tarred was placed on the board and the tar applied to the stone by scattering with a swinging motion from a dipper fastened to a



wooden handle of a convenient length to reach well down in the tar kettle.

After the first application of tar, the pile of stone was turned over twice by shoveling, the shovels being kept hot to facilitate the process. The operation of tarring was again gone through with alternate turnings of the mass until no bare spots could be seen on the stones, or, in other words, until each stone had a coating of tar.

To give the best results, the broken stone must be entirely free from moisture before being tarred. As soon as the stone and tar had been thoroughly incorporated, it was wheeled onto the roadway and raked into conformity with the cross section.

It was found that if the rolling of this course were left for two or three days after being placed on the road, it required more rolling to compress and did not bind so firmly as when rolled soon after being laid, or as soon as a stretch of sufficient length to operate the roller economically had been laid. The stone used in this course was broken to a size to pass through a 2½-inch ring, and was laid to a depth of 5 inches, as nearly as possible, before rolling.

The third or top course was com-

posed of gravel screened through a ½-inch mesh and mixed with tar, about 20 gallons of tar being used to 1 cubic yard of gravel. This was mixed in an asphalt mixer and brought to the work hot, scattered over the roadway, and raked in very carefully, the utmost care being taken to get the surface to true grade and section, none but the most experienced men being employed in this portion of the work. The whole was then rolled, after which screenings from the crusher were scattered broadcast over the surface to be worked in by traffic, the object being to harden the surface of the pavement and to give it a more pleasing color than the dead black of the tar.

The curbing constructed with this pavement was composed of Portland-cement concrete. The usual method of construction was reversed, inasmuch as the curbing was laid after the pavement had been constructed, the reason being that it was found to be much easier to set up the molds for the curb, the pavement being used to place the edges of the mold boards upon. As soon as the curb had set, the molds were taken off and the ragged edges between the roadway and curb filled in with concrete and finished with

cement mortar.

The method of constructing sidewalks outside the tree line and immediately alongside the traveled road has been employed here very extensively, and wherever this is done the curb is combined with the sidewalk. Whenever possible, the tar-macadam has been laid before the sidewalk, so that the walk might not be disfigured with tar. This class of pavement has proved to be particularly well adapted for residential streets, and streets where the traffic is spread evenly over the whole surface, but it is not satisfactory alongside street-railway tracks, where the traffic is confined to a narrow space on each side of the tracks. In several stretches put down here in 1899, along the street-railway tracks, the pavement shows distinctly the marks of excessive wear.

No repairs have as yet been made on any of the pavements laid within the last three years. Some pavement, similar in construction, put down by the local gas company eight or ten years ago has been recently resurfaced at a cost of 25 cents per square yard, no repairs being done up to that time. The advantages of this class of pavement may be summed up as follows: Economy in construction, the average

price for 1901, with labor at 15 cents per hour, being \$1.06 per square yard; good foothold for horses; and absence of dust—therefore economy in cleaning and sprinkling.

As an illustration of how this pavement will withstand disintegration, I may state that on the night of April 29, 1901, during an unprecedented snow and rain storm, a large drain 8 by 2½ feet by 5 miles, situated on the plateau above the city and immediately at the upper end of the streets recently paved with tar-macadam, choked, the whole volume of water coming over the mountain and rushing down over the pavement from 12 to 18 inches deep for twelve hours. The grade of the street is 3.4 per 100, so that the velocity was such as to carry with it large boulders and debris which has been dislodged from the side of the mountain in its descent.

The upper portion of the street was composed of plain macadam, the materials of which were all swept away, leaving ruts and holes in some cases 2 to 3 feet deep.

The tar-macadam immediately adjoining this was practically unharmed, excepting alongside the curb where the surface coating was worn off in spots.

## SUIT PROTECTOR AGAINST LIVE WIRES.

PROF. NICHOLAS ARTEMIEFF, director of the electro-technical institute in Kieff (southern Russia) has invented a suit protector, or protective suit, which is primarily destined to be worn by students in laboratory experiments, but can also, as has been shown by repeated trials, be employed in general electrical work. So practical, in fact, has the suit been found, that it has been put upon the market. The following description has been received from the manufacturers.

The suit consists of fine and closely woven elastic material, made of metal fibres on a foundation of linen. It covers the whole body, as well as the head, hands and feet. It is so arranged that it can be put on without outside assistance, and the openings by which it is passed over the body do not interfere with its availability, provided that they are carefully fastened together. The suit is worn over the ordinary clothing, and the network does not prevent the use of the hands nor does it interfere with the vision. It does, however, so effectually protect the body that a man attired in the suit can move without danger in the midst of live wires: and if he adopts the further precaution of standing on a rubber or porcelain insulator, he can withstand a current of 200,000 volts. It should be understood that in this case the opposite poles are not connected, as this would involve a short circuit. The metal suit prevents the entrance into the body of dangerous currents: but it does not protect against burning, on account of short circuits with strong currents, unless

certain precautions are taken. If the current is of a strength of 200 or even 600 amperes, for a space of several seconds there is absolutely no danger. But if the insulators are weak, and the protective suit is removed from the conductors before the current is interrupted, a spark will follow that



will injure the material and burn the flesh beneath.

In cases of very high tensions, 150,000 volts and more, one conductor (or even both conductors at the same time) of a 20 kilowatt transformer can be

touched without injury to the protective suit. The conductivity of the suit is so slight, that even in short circuits, only a weak current will be admitted—perhaps 1 or 2 amperes. The suit will thus not be injured, and can be employed freely in positions that would otherwise be dangerous. Even in the cases above described, when owing to the lack of proper care, the wearer of the suit is subjected to a

also in actual work, and will be found to have decided advantages over rubber shoes or gloves. A fireman wearing this suit can handle hose at a conflagration regardless of the wires that may be strung in the neighborhood, whose presence has often caused serious injury to the workers. The outfit is especially valuable to those engaged in mending live wires.

The manufacture and sale of the



short circuit and receives a burn, the injury is not so serious as it would be if he were not protected by the armor: under similar circumstances, a man ordinarily attired would probably not escape with his life.

The protective suit is serviceable not only in laboratory experiments, but

armor has been undertaken by the well-known electrical firm of Siemens & Halske, in Berlin. The suit is prepared in three sizes, for large, small and medium-sized people.

The accompanying illustrations show the suit with its different applications.



## - - - RADIUM. - - -

No recent discovery has so interested the scientific world, not only on account of the wonderful properties which it already exhibits, but because of the potentialities hinted at, as that of the new material radium. What radium is, no one knows. Information is limited to some of the results it accomplishes. These include the melting of ice which is placed in its vicinity, through heat radiations, which are continuous and take place without combustion: the exciting of phosphorescence in certain objects on which the rays of the radium fall: the efficacious treatment of skin diseases and cases of lupus, etc. It is said that it can even be used to cure blindness, by its indirect action on the optic nerves; and it is now being employed in Paris to test diamonds, as a genuine stone will phosphoresce in the presence of radium while the imitation gem will not.

The substance was first discovered, or isolated, by M. Curie, a French physicist of the highest reputation, and further investigation by eminent English and American scientists have only served to confirm his conclusions as to its remarkable properties. Radium, as stated, emits so much heat that it melts more than its own weight of ice every hour; or, to express it differently, half a pound of radium salt would evolve in one hour heat equal to that produced by the burning of one-third of a cubic foot of hydrogen gas; and this evolution of heat goes on continuously for indefinite periods, leaving the salt at the end of months of activity just as potent as at the beginning. There has been no combustion, no chemical change of any kind, and no change in the molecular structure of the salt, although the temperature is maintained by the heat generated at a point nearly 3 degrees Fahrenheit above its surroundings. Apparently, radium has the power to gather up and convert into heat some form of energy with which the world is not acquainted, and the investigation of the causes of this action are full of promise for the physicist.

Another property of radium which has excited keen interest is its power of throwing off rays, or vibrations, which, when received upon a sensitive screen of zinc sulphide or mica, cause it to glow with a phosphorescent light. Sir William Crookes, at a demonstration before the Royal Society of England, showed that, viewed through a magnifying glass, the screen is the object of a veritable bombardment by particles indefinitely small, which, themselves invisible, make known their arrival on the screen by flashes of light, just as a shell announces itself on falling by an explosion. Though working with only a few milligrams of the radium salt, Sir William Crookes found that so remarkable are these vibrations, or emanations, that every vessel with which they come in contact, and even the fingers of the operator, acquired temporarily the power of exciting phosphorescence on

the sensitive screen. Yet, notwithstanding their infinite number and the continuity of their emission, the mass of the radiating body appears to suffer no diminution, as in case of the heat rays which it produces.

The source of the phosphorescence emitted by the firefly and the glow-worm, as well as by certain bacteria, has never been known to science, although recent discoveries tend to prove that most substances store up sunlight during the day and emit it in the form of rays during the night—some producing rays that are powerful enough to be seen by the naked eye, others emitting rays that are absolutely invisible, just as are chemical or actinic rays in the spectrum. It is even said that light emanates from the human body, and it is probable that a mouse can perceive a man, in a dark room, by the light proceeding from the man himself. But the source of the light rays of radium is thought to be of another nature. Professor Thomson, of Cambridge University, has a theory based on the modern conception of the atom as a structure made up of countless smaller atoms. In a piece of radium, the professor thinks there will always be some atoms in a condition of instability, and liable on slight provocation to undergo a change in configuration. Such a change would liberate the energy originally stored there. All opinions on the subject that are expressed, however, are provisional.

The physiological action of the radium emanations is very powerful, although time is required for its development. A small tube containing radium, if held in contact with the skin for a few hours, or even if carried in the pocket, produces an open sore, by destroying the skin beneath. The effects do not, however, appear to extend to the underlying tissues, and the sore remains superficial. On the other hand, radium emanations act powerfully upon the nerve substance, and cause the death of living things whose nerve centres do not lie deep enough to be protected from their influence.

Very little radium has so far been isolated—it is found mainly in pitchblende—and its cost is beyond that of any substance ever known. It is claimed, however, that in Utah there are large deposits of uranium ores, and analysis has shown that radium exists in these ores in the proportion of about one gram of radium to each ton of uranium. Arrangements are now being made for the chemical reduction of these ores, when metallic uranium will be produced, and radium as a by-product, at a very slight increase in the first cost of reduction. If this be true, we have a future source of power and wealth that will be invaluable, as further research will certainly develop new uses for this miniature sun: and when it can be produced in available quantities, it may be employed for heating purposes, or motive power, or to replace the common X-ray apparatus.

## MALTESE LACE.

On the continent of Europe and in England, Maltese lace is celebrated, and of late years its fame has been increasing until the quantities exported from these islands have assumed large proportions. Its reputation has even reached the United States, where, until the last year or two, there seems to have been but a dim idea of its beauty and other good qualities. Maltese lace bids fair to become popular in the United States. According to a recent work by M. Pierre Verhaegen, lace making is dying out among the European peasants, particularly in Belgium, where the production is decreasing on account of the small earnings of the women en-

there is hardly a family among the poorer classes in the islands that does not produce lace. All of it is handmade. The people have a deeply rooted aversion to labor-saving machinery of all kinds. In many lines of industry the methods in vogue years ago are employed to-day. The art of lace making is handed down from family to family, and often one will find a beautiful design made by only one family. The recent impetus to trade has caused lace making to be taught in the schools.

During the past six months more lace has been invoiced to American dry-goods houses than for forty years. There are several firms which are capable of filling large orders. These control the work of many families



gaged in the industry. It is said that their maximum wages amounts to but 2 francs (39 cents), while inferior work brings but 50 or 60 centimes (9 or 11 cents) per day of eleven working hours. It is also stated that the introduction of lace-working machinery has greatly influenced the low prices paid for labor. Conditions in Malta are different. The greater part of the lace exported is made in the island of Gozo, one of the Maltese group. The population of Gozo is estimated to be about 25,000, of whom 10,286 are women and girls. It is safe to say that at least three-fourths of this number are occupied with lace making. The peasantry of the island of Malta are also more interested in this industry than for many years past. As a result of the increasing demand,

and supply them with the silk or cotton used in making the lace. Wages are low and the peasant housewife is satisfied if she can add to the family exchequer by employing her spare time in making lace. As her children grow up she trains them in the art, and it is not long before the female contingent of the family are found to be important factors in the support of the household. Among the articles made may be mentioned handkerchiefs, edging, parasol covers, pillow covers, collars, boleros, lamp shades, shawls, mantillas, and even whole skirts. Silk is the chief material used, but of late there has been a demand for cotton lace. An idea of the work may be gained from the accompanying picture which represents a lace pillow cover.

# P A T E N T S

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-THREE YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

**INVENTIVE AGE**

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

**E. G. SIGGERS,** 918 F STREET, N. W.,  
WASHINGTON, D. C.

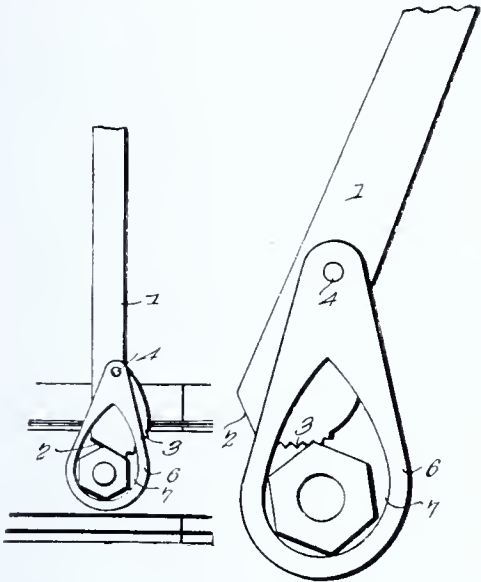


## CLEVER NEW PATENTS.

**Wrench.—Door Hinge.—Washing Machine.**  
—Tincture-Extractor.

### Wrench.

Charles Fredrick Bettmann and Samuel Talkington, of New Albany, Indiana, have patented a unique wrench for use on railroads. Among the many advantages of the wrench is its ability to positively engage smooth approximately round nuts, and to present a smooth flat face to new nuts to avoid injuring the latter and to enable the same to last much longer than when operated on by toothed wrenches or similar tools, which cut into the nuts.



Referring to the illustration, 1 designates a bar or lever provided at one end with a jaw having a smooth engaging face 2 at one side and a toothed face 3 at the opposite side, the smooth face 2 being adapted for engaging new nuts to avoid injuring the same, and the toothed face being adapted to engage old and worn hexagonal or similar nuts which are nearly round. The bar or lever is pivoted between its ends by a pin 4 in a slot or bifurcation of an approximately oval movable jaw or member 6. The movable jaw or member, which is tapered, is provided with a nut-receiving opening 7 and is adapted to be placed over a nut. The outer or bottom portion of the jaw or member is curved or rounded and the sides are tapered, forming an inverted V-shaped upper portion. The lower curved portion is sufficiently thin to enable it to be introduced between the nuts of a rail joint, and the bottom flanges of fish plates or rails. The bar or lever is adapted to be oscillated to swing its fixed jaw through the slot or bifurcation to either side of the opening 7, whereby either of the faces 2 and 3 may be brought into position for engaging a nut. A nut is rotated by placing it in the movable jaw or member, as illustrated in the accompanying cut. The bar or lever is then oscillated to carry its fixed jaw into engagement with the nut. The wrench is adapted to rotate the nut in one direction, and the movable jaw may be swung backward independently of the nut for enabling the wrench to take a fresh hold on the same. By simply reversing the wrench, the nut may be screwed on or off a bolt.

### Door Hinge.

William L. Evans, Jr., of Washington, Indiana, has secured a patent for a novel and meritorious door hinge, which contains an ingeniously arranged spring adapted to close a door automatically. In the illustration, 1 designates a leaf or plate designed to be secured to a door frame, and provided with lateral extensions or wings 3 to form bearing faces for rollers 4 of a leaf or plate 5, which is secured to a door 6. The plate 1 is provided with an approximately U-shaped supporting frame 10, which is provided at its inner end with a bearing opening 12 for the reception of the inner or rear end 13 of a guide bar 14. The outer or front end 15 of the guide bar is arranged in a bearing opening 16 of the inwardly extending transverse portion 7 of the plate 1 and is provided with a groove for the reception of the blade of a screw-driver for enabling the bar 7 to be rotated. The reduced ends of the guide bar 14 form journals to permit the same to be rotated for moving a nut 18 inward and outward to vary the tension of a coiled spring 19. The nut 18 is arranged on a threaded portion 20 of the guide bar and receives the outer or front end of the coiled spring 19, which has its other end engaging a yoke 21. The yoke 21 conforms to the configuration of the supporting frame and is approximately U-shaped. The yoke is also connected by a pin 22 with the lug 9 of the leaf or plate 5. The opening of the door carries the lug 9 outward from the recess or cavity of the center of the

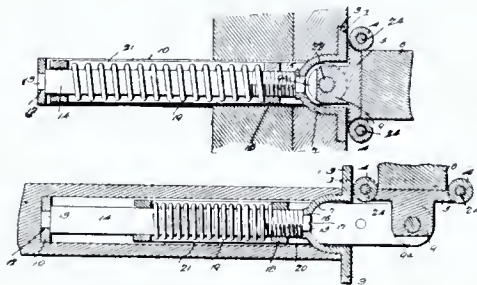


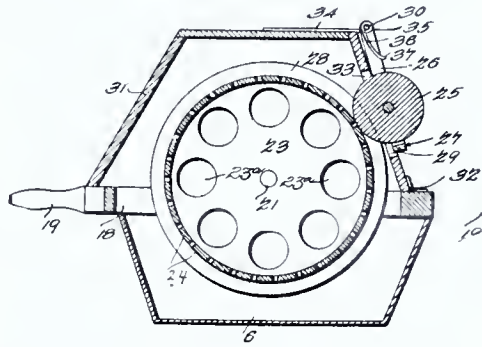
plate 1 to the position illustrated in the lower Figure of the accompanying cut and when the door is released, the spring will expand and return the door to its closed position. After the door has been hung, the spring can be given the desired tension by opening the door the full width and inserting a screw-driver in the groove of the outer end of the rotary guide bar. Should occasion require the door to be removed, the yoke may be locked in its extended position by placing a plug or pin in a perforation, located near the outer end of the yoke.

### Washing Machine.

Nat Densler, of Bowie, Texas, has invented an improved washing apparatus, which is adapted to be used in connection with an ordinary tub or receptacle.

Referring to the illustration 6 designates a tub, upon which the washing mechanism is removably placed. The washing mechanism comprises a frame

18, and a hinged cover 31, the frame being provided with suitable bearings for the shaft of a rotary drum 23. The clothes are applied to the slats 24, which are spaced apart and which connects the ends of the rotary drum. The cover is provided with a spring-actuated roll 25, mounted exteriorly and extending through an aperture of



the cover to engage the clothes. When the cover is swung backward, the rotary drum is relieved of the pressure of the roll 25, and when the cover is closed the roll is automatically placed under tension. By rotating the drum, the clothes are rapidly washed. The machine is simple and inexpensive; is easily operated, and is capable of rapidly and thoroughly washing clothes and other fabrics.

### Tincture-Extractor.

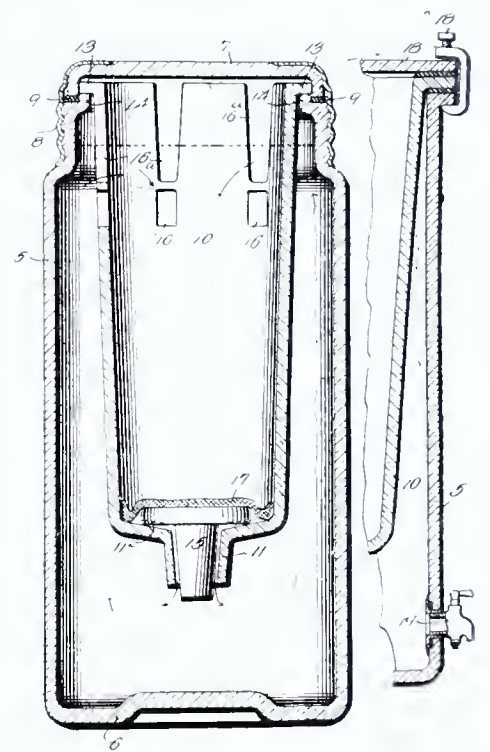
A tincture-extractor of a very simple though efficient nature has been devised and patented by Dr. Henry Redlich, of Chicago, Illinois. The invention consists in a closed hermetically-sealed vessel having suspended therein a receiver for the substance or compound from which the tincture is to be extracted, and with means whereby the menstruum may be caused to automatically and constantly flow through the apparatus, without permitting the escape of any portion of either the menstruum, the compounds or substances from which the tinctures are extracted, or the tinctures themselves, by evaporation or otherwise.

The apparatus consists of an outer casing or shell 5, preferably of glass or other material of a close impervious nature, which will not only resist the action of acids, but will also be air and moisture proof. This casing has a closed bottom 6, and a moisture and air tight cover, the latter preferably formed with a glass or similar portion 7, and a screw-fitting collar 8, with a rubber or other flexible gasket or packing-ring 9. By this means, the cover may be fitted closely and held firmly upon the casing, and all chance for the entrance or escape of air or moisture is obviated.

Suspended within the casing 5, is a vessel 10, which constitutes the receiver for the compound or substance from which the extract is to be obtained, the bottom of the receiver being provided with a centrally-dis-

posed open-ended tubular extension 11. The receiver is provided with a rim 13, around its upper edge to engage a shoulder 14 on the casing 5, and by which it is supported within the same. The extension 11, is adapted to receive a loosely-fitting plug 15, which is designed to prevent escape of any material from the receiver into the casing or body, and is formed of glass or other acid-resisting substance. The walls of the receiver 10, are imperforate; but near its upper part it is provided with a series of perforations 16, which afford communication between the same and interior of the casing 5. If the material which is placed in the receiver is of a nature to require it, a packing 17, is placed in the bottom of the receiver to prevent the escape of the matter around the plug 15.

When thus constructed, the operation is as follows:



The cover 7, and the receiver 10, being removed, the vessel 5, is supplied with a menstruum, which may be of any suitable substance or compound—such as diluted alcohol, wine, spirit, vinegar, or water, etc., according to the substance to be treated. The receiver 10, is then supplied with its plug 15, and fabric packing 17, if one be required, and the substance or compound to be treated placed in the receiver. The latter is then slowly lowered into the vessel 5, giving the menstruum time to enter the receiver and percolate through the compound, care having been taken that the quantity of menstruum previously placed in the vessel 5, shall be sufficient when it has thoroughly percolated through the compound in the receiver to rise above the perforations, as indicated by the dotted lines. As the menstruum acts on the material or compound in the receiver, the extract slowly sinks through the interstices around the stopper or plug 15, and sinks to the bottom of the vessel 5, displacing a certain quantity of the menstruum and causing it to flow over into the upper part of the receiver 10, through the perforations 16, and thus cause a continuous circulation throughout the apparatus and insuring the constant automatic action therein.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Earl Sherwood, Honesdale, Pa. Car Fender. Two patents. — These patents disclose further developments of the car fender shown in the inventor's earlier patents No. 594,434 and 650,491. The first of the improvements contemplates the mounting of the fender in a manner which will cause it, when elevated, to assume a position permitting the coupling of the cars, thus avoiding the necessity for the removal of the fender as usual. It also embodies a simple arrangement whereby the fender will be locked against detachment when in its operative position, and will be automatically unlocked to permit its removal when elevated. This patent also shows further improvements in the automatic trip mechanism, which serves to depress the fender to a position close to the tracks when a person or other object is struck.

The second patent is directed to the provision of a number of features which simplify the construction of the fender, and are also designed to increase its efficiency, the various frame parts being so formed that the structure may be built up of cold metal bars capable of being assembled and mounted quickly and conveniently without the aid of skilled labor. Provision is made for adjustment to accommodate ears having their decks located at various distances from the road bed, the automatic fender locking mechanism being so improved that it will be impossible to remove the fender from the car in either its completely elevated or depressed positions, it being necessary to present the fender in an intermediate position when its detachment is desired.

Gjermund H. Kravik, Belview, Minn. File.—This patent provides for a most ingenious combined ledger file and index, having in view the provision of simple means for keeping accounts and indexing the same to enable them to be selected quickly and without inconvenience. The file is constructed upon the principle of the card index system, and includes a case in which novel file wrappers for each account are placed in alphabetical or indexed order. Each file wrapper is constructed to hold sale strips or the like and a ledger ruled page to which may be transferred the total amount of each sales slip. By this arrangement, the necessity for keeping a complicated set of books is avoided, the account is rendered easily accessible, and the sales slip constituting the original or primary evidence of the sale is preserved with the account.

Albert B. Carter, Hazelhurst, Miss. Car Coupling.—The inventor provides certain improvements whereby the draw bar is capable of endwise yieldable movements under draft and buffing strains and at the same time is held rigid or stationary with respect to lateral movements, so as to obviate wear incident to the ordinary swinging type of draw-bar. It is furthermore designed to compensate for the relative rigidity of the draw-bar, so that a pair of coupled draw-heads may not become uncoupled when rounding a curve.

It consists of a draw-head which is held against lateral movement and is provided with a vertically movable coupling pin which is fixed against lateral movement, a coupling link separate from the draw-head and provided with a lateral shoulder for engagement with the pin, and a spring to bear against the outer side of the link, and yieldingly hold the shoulder thereof in engagement with the coupling pin.

Lewis H. Livingston, Inventor; Ira A. Butcher, assignee, Hennessey, Okla. Ter. Threshing Machine.—The machine disclosed in this patent is based upon the observation that in threshing grain, particularly such as is not fully matured, a certain portion of the grain passes to the pneumatic stacker with the straw and is deposited with the straw upon the stack. The machine is designed to have a combined mechanical and pneumatic action, which has been observed to be effective. It includes the usual threshing mechanism, beyond which is located a chamber having a grate bottom above which a beater rotates at a high rate of speed. Beyond the opposite ends of the chamber and communicating therewith are a pair of fan casings having discharge spouts directed rearwardly toward a straw carrier. Within the fan casings are located fans which rotate at a high rate of speed for the purpose of drawing the straw into the casings to be projected thence to the carrier. The greater portion of the grain which does not drop through the screen before reaching the chamber, will be effectually separated by the combined action of the beater and the strong current of air induced by the fans, and will drop through the screen. The small percentage of grain which is not recovered in this way, will be carried into the fan casings with the straw, and as the latter is violently carried around by the fans, the grain will be effectually separated and permitted to drop through openings in the bottom of the fan casings prior to the delivery of the completely separated straw to the carrier.

Oliver Boyer, Inventor; William H. Orr, assignee, Lima, O. Corn Husking Machine. This invention is directed particularly to the production of convenient mechanism arranged for association with corn husking devices, to separate from the fodder or chaff such grain as may be shelled from the cob and fed back toward the waste conveyer with the fodder. The separating mechanism comprises a main casing arranged in rear of an ordinary husking machine. At the end of the casing opposite the machine is located a suction fan enclosed within a casing, which communicates with the waste conveyer. Located within the main casing is a separating rack, which is given a vibratory motion to separate the grain from the husks, and to feed the latter back toward the suction fan. As the corn drops from the rack, it is thoroughly cleaned by the blast from a blower located beyond the front end of the casing and discharging into the lower end of a riddle shoe having a screen top through which the corn is designed to gravitate. The blast from the blower having passed through the falling body of grain, assists in carrying the husks back to the suction fan, the parts being so arranged that the husks will drop from the rear end of the rack, and into the blast from the blower. The cleaned corn passes from the riddle shoe to conveying mechanism, which deposits it at any desired point. This separating mechanism is obviously effective, and its use results in saving a large quantity of corn which has heretofore been wasted.

Jacob L. Blanton, Inventor; Sharon, N. C. Robert L. Short and John H. Hurt, Cherryville, N. C., assignees of two-thirds interest. Fertilizer Distributor.—The object of the invention is to provide a fertilizer dropping apparatus, which is made inoperative during a rearward movement of the implement, particularly when turning at the end of a field. It consists of a beam, a supporting wheel therefor, a hopper supported on the beam, a feed device for the hopper, a ratchet disk carried concentrically by one face of the wheel, each tooth of the disk having an abrupt face or shoulder and a rounded or inclined face, leading from the outer end of the shoulder to the inner end of the abrupt shoulder

of the next adjacent tooth, a tappet-arm connected to the feed device of the hopper, and a ratchet dog carried by the free portion of the arm and provided with a rounded or inclined face working over the inclined face of the ratchet teeth, and also having an abrupt shoulder for engagement with any of the abrupt shoulders of the ratchet teeth, to prevent rearward rotation of the wheel, and therefore avoid operation of the feed device.

Benjamin W. Berry, Monticello, Fla. Vehicle Pole.—The object of the invention is to provide a rigid connection between the rear end of the tongue or pole, and the front axle of the vehicle, and to facilitate the application and removal of the pole. The special design is to permit of a vertical-swinging movement of the outer end portion of the pole so as to obviate strain upon the draft animals when the vehicle is passing over uneven ground or obstructions.

It consists of an axle having a king-bolt opening, a tongue or pole having opposite sections lying in engagement with the respective front and rear sides of the axle and in line with the king-bolt opening thereof, a plate or strap applied to the upper sides of the pole sections and the axle and connecting said sections, the strap being provided with an opening registering with the king-bolt opening of the axle, a bracket embracing the lower side of the axle and provided with upper terminal ears lying against the under sides of the respective pole sections, and fastenings piercing the connecting plate, the pole sections, and ears of the bracket. The sections or members of the pole or tongue are arranged so that the rear member has a rigid connection with the axle, and the front member has a vertically swinging pivotal connection with said member, a stop being provided to limit the vertical swinging movement of the front member.

Wm. A. Taylor, Inventor; James A. Sanderson, assignee of one-half interest, French Camp, Miss. Harrow Attachment.—The invention aims to provide a plow attachment which may be conveniently applied to an ordinary side harrow, so as to travel in rear of the teeth thereof, being readily detachable when not required for use. The attachment is also adjustable so that it may be shifted to the right or left, and raised or lowered to regulate the depth of the plow.

It consists of a plow beam projected rearwardly from the tooth bar of the harrow and having a standard and a plow carried thereby, the front end of the beam having an eye, a clevis embracing the tooth-bar and the eye of the plow-beam, a pin passed through the clevis and the eye, braces rising from the beam to the handles with their upper ends provided with perforations, and fastenings piercing the handles and corresponding perforations of the braces.

James A. Yearont, Inventor; Frank D. Miles, assignee of one-half interest, Lyndon, Kansas. Insect Destroyer.—The inventor provides a device which is adapted to be set up out of doors, and contains a light to attract the insects. It is provided with means to obstruct the flight of the insects, and to deflect the latter into a liquid bath so as to entrap and kill the same.

It consists of a receptacle adapted to contain an insect destroying agent, a lamp located within and supported upon the bottom of the receptacle, radially disposed deflectors grouped about the lamp and removably supported upon the receptacle and provided at their outer edges with upstanding laterally projected flanges, and a top or cover movably supported upon the top edges of the deflectors and provided with marginal notches to receive some of the edges of said deflectors. The flanges, which are adjacent to the notches, form stops to prevent lateral displacement of the top or cover.

John C. Bledsoe and Adam A. Bilyeu, Talala, Indian Territory. Vehicle Hub.—The invention relates to that class of vehicle hubs which are made of sectional parts, the object being to provide certain improvements, whereby the hub sections may be conveniently assembled in setting up the wheel, and also adjusted to tighten the hub, the spokes and tire of the wheel, should any of these parts become loosened by wear. It is also designed for correcting the dish of the wheel without taking the latter apart, and even without removing it from the axle. The wheel hub is made up of a box, a circumferential series of sockets which are tiltable upon the box, a hollow substantially conical wedge having a screw-threaded engagement with the box and in cooperative relation with the spoke sockets to adjustably tilt the same, and means to prevent slidable movements of the sockets when being tilted. The invention is broadly covered by a number of very important claims.

Jesse J. Felder, Navasota, Texas. Harness Hook.—The aim of this invention is to provide an improved snap hook which dispenses with springs and movable members, and at the same time, effectually guards against accidental disconnection of the hook from a ring or the like. The construction is such that the hook may be manipulated with gloved or mittened hands, in order that the hook may be connected and disconnected in severe wintry weather.

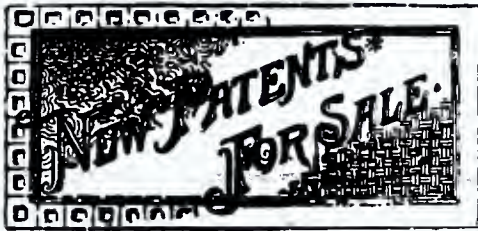
It consists of a hook having a shank, provided with a pair of substantially parallel reversely-disposed hook-shaped fork members separated by a longitudinal interspace to allow for the insertion of a ring or other object throughout said space, the bill of each hook overlapping the body portion of the other hook and terminating short of the juncture of the fork members and the shank, the terminals of the bill being directed inwardly in opposite directions in the horizontal planes of the respective fork members and arranged out of contact, but extending across each other so as to intersect the medial line of the hook.

Douglas M. Campbell, Inventor; The Campbell Cotton Tie Buckle Co., assignee, Houston, Tex. Bale Band Fastener.—This fastener includes a winding key in the form of a small metal block or plate which engages the lapped ends of a bale band, and is turned to wind the ends thereof for the purpose of taking up the slack in the band. With this winding key is associated a lock comprising a cross-bar and two leg portions. The cross-bar is disposed across the band and the leg portions, which are of angular form, are passed into openings in the winding key at opposite sides of the wound portion of the band. The lock associated with the key in this manner effectually prevents the unwinding of the band, and also precludes the possibility of accidental displacement of the key. This fastener is so extremely simple and effective that its commercial success appears to be assured.

Frederick Booth, Michigan City, Indiana. Chainless Bicycle.—The invention relates to what are known as chainless bicycles, and the object is to provide a novel form of driving mechanism, in the use of which the machine may be checked or stopped without employing a brake.

It consists of a frame, a rear wheel and pedal crank-shaft, a driven gear carried by the rear hub, the adjacent lower frame-bar being extended downwardly below and in rear of the driven gear, thence extended inwardly beyond the gear, and then projected rearwardly, a driving gear mounted upon the outer side of the rear end of the extended frame portion and in mesh with the driven gear, and a connecting rod between the driving gear and the adjacent pedal crank.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 719,170, dated Jan. 27, 1903. Folding Camp Chair. Possesses great advantages over other camp chairs. Address, Ely T. Zimmerman, Mansfield, Ohio. oct

**FOR SALE**—Patent No. 728,945, dated May 26, 1903. Ratchet Pipe Wrench. Any one may send in his offer for any state, county, or shop right, or the entire right. Highest bidder will secure the patent right. Address, Joseph Levy, Verdigris, Nebr. oct

**FOR SALE**—Patent No. 727,442, May 5, 1903. Hoisting device. Cheap in construction, double acting; for use inside or outside of buildings. Address, Michael Rath, Two Rivers, Wisconsin. oct

**FOR SALE**—Patent No. 708,736. Round Axle Ball-bearing Fixture for Shade Rollers, Carpet Sweepers, Awning Rollers, etc. For full particulars address, John Renner, 612-614 Jefferson St., Burlington, Iowa. oct

**FOR SALE**—Patent No. 726,752, dated April 28, 1903. Ship's Table. Always remains horizontal, no matter how the ship rolls or pitches. Address, William J. Preater, 224 Franklin Street, Elizabeth, N. J. oct

**FOR SALE**—Patent No. 726,610. Bicycle Canopy. Every bicycle made wants a canopy. Will sell outright or lease on royalty. For full description address, Martin Zech, Prairie du Sac, Wis. oct

**FOR SALE** or on royalty—Patent No. 731,922. Display Rack for lace curtains, bed spreads, etc. In cabinet form on casters; easy to move around; cabinet 20 inches deep; holds 42 hanger arms; can be made in any size. Also Canadian patent. Address, Lindquist & Agle, Argyle, Minn. oct

**FOR SALE**—Patent No. 727,204, dated May 5, 1903. Rogers Spectacle Holder. Will sell part or on royalty. Only device for carrying spectacles when not in use. Does away entirely with a clumsy case. Rare chance for some one. Address, A. W. Rogers, Fort Myers, Florida. oct

**FOR SALE**—Patent No. 721,532, dated Feb. 24, 1903. Sheet-music Cabinet. Makes it just as easy to handle 500 pieces as to handle five. For simplicity and convenience, has no equal. Address, C. P. Baron, Haymond, Franklin County, Indiana. oct

**FOR SALE**—Patent receptacle for molasses. Patented April 14, 1903. Can be manufactured at a good profit. Every housekeeper will have one. Send for drawings, free. Address, G. R. Turner, 19 Sewall Street, Augusta, Maine. (sep)

**FOR SALE**—Patent No. 726,809. Car Seal, dated April 28, 1903. Very simple and practical. A first-class patent. Terms \$6,000 cash. Address, Thomas White 139 West 27th Street, Ogden, Utah. (sep)

**FOR SALE**—Patent rights for building construction. Can be secured for single territories at cheap rates from the patentee. Address, H. Maring, Architect, No. 103 East 126th Street, New York, N. Y. (sep)

**FOR SALE**—One-half interest or the entire patent of a good practical machine for use in tin shops. Address, A. B. Hill, 634 18th St., Denver, Col. (sep)

**FOR SALE**—Patent No. 726,668. Wire Stretcher. Will sell outright. For particulars address, Charles J. Fox, Leavenworth, Kansas. (sep)

**FOR SALE** or manufacture on royalty—A patented pin for securing a belt. A new idea; not a buckle. Address, M. M. McGrath, 150 Maplewood Ave., Germantown, Philadelphia, Pa. (sep)

**FOR SALE**—Patent No. 725,956. Improved Railroad Switch. Prevents all wrecks from open switches; practical, simple, inexpensive to manufacture. Price \$10,000. Address, E. L. Alderman, 445 High Street, Holyoke, Mass. (sep)

**FOR SALE**—Patent No. 723,173. Will no doubt be adopted by all railroads when fully known. Invented and patented by a railroad conductor. Patent for sale, or royalty will be considered. Address, J. W. Marthis, Columbus, Nebr. (aug)

**FOR SALE**—Patent No. 722,840. Machine for picking prunes or like fruits. Should be in the hands of every fruit grower. Address, John H. Hammer, Medford, Oregon. (aug)

**FOR SALE**—Patent No. 723,064. Cement Fence Post. Most practicable and valuable invention of the age. Stands up to every test. State, county, and township rights for sale. Address, Louis H. Stoner, Albany, Indiana. (aug)

**FOR SALE**—Patent No. 723,705. Grate. Easy to put in stove or range, and can be sold cheaply. Will save coal. Will sell United States Patent or sell state rights. Address, Mrs. Clara Nunan, Box 67, Cape Porpoise, Maine. (aug)

**FOR SALE**—Patent No. 723,248. Farm Gate. Testimonials furnished as to practical value of gate. Write for particulars to F. M. Dann, Footville, Wis. (aug)

**FOR SALE**—Patent No. 723,695. Metallic joint for cross bar, thill coupling, and poles. Malleable iron. Quickly put on. Simple and strong. For repairing broken tenons and irons cannot be beat. Address, John G. Lovejoy, Greig, N. Y. (aug)

**FOR SALE**—Patent No. 721,948, March 3, 1903. Wire stretcher for woven or barbed wire. Simple, rapid, durable, powerful. Proven the best. Ask for model. J. A. Foster, Salem, Wis. (aug)

**FOR SALE**—Patent No. 718,107, dated January 13, 1903. A dishwashing machine. Does good service, and is easily propelled. Address, Anna M. Dunder, Crete, Nebraska. (aug)

**FOR SALE**—Patent No. 723,364. Rail-joint Nut Lock. The best yet for safety, simplicity, durability and economy. For particulars address, Frank Chambordon, Braeburn, Pa. (aug)

**FOR SALE**—Patent No. 33,474. Railroad Rail. Price \$100. Address, Charles Kofske, Applington, Iowa. (aug)

**FOR SALE**—Patent No. 724,276. Corn Harvester and Husker. Very simple and practical. Address, Arthur Forgy, Middletown, Missouri. (aug)

**FOR SALE**—Patent No. 652,655. Improved Trace Fastener. A splendid invention. Address, W. G. Lee Woods, San Antonio, Tex. (sep)

**FOR SALE**—Patent No. 703,118. Draft Rigger for Railroad Cars. Address, Wm. H. Cox, Iron Mountain, Michigan. (sep)

**FOR SALE**—Patent No. 723,020. Grain Shocker. Address, Amil F. Ponath, Greatbend, N. D. (sep)

## WANTED.

**WANTED**—What have you to offer? Being manufacturers and large dealers in Agents' supplies, we are always looking for fast selling articles. Who has self-heating sad-irons? Address, Voorhees & Centennial, Trenton, N. J. (aug)

**WANTED**—Agents to sell state and county rights for my wire reel apparatus. Patent No. 726,855, dated May 5, 1903. Address, Jesse W. Brooks, Churchhill, Texas. oct

**WANTED**—A partner with capital to promote patent, manufacture and sell the same. Invention is a Rotary Engine of a new type. For particulars address, J. B. Pollard, Box 343, Roanoke, Va.

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. The ARMY AND NAVY MAGAZINE, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00

## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America. For rates, address—

The Railway and Engineering Review, 1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers, Send for sample copies. ALLENTOWN, PA.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

FRED. B. NICHOLS & CO.,

913 E St., N. W.,

Wholesale Stationers, Washington, D. C.

## SELF-EDUCATION FOR MECHANICS.

A Monthly Journal intended as a Guide to Correct Methods in Work and Study.

25c. A YEAR. SAMPLE COPY FREE

Industrial Publication Co., 16 Thomas Street, - - NEW YORK.

## ...SILK...

A JOURNAL PUBLISHED MONTHLY.

Devoted exclusively to the Raising of SILK and the Manufacture of the same. Only one dollar (\$1.00) a year.

Subscribe now. It contains information you ought to know.

Address,

SILK PUBLISHING COMPANY.

Tallulah Falls, Georgia.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— The Inventive Age Pub. Co.,

918 F St., N. W. WASHINGTON, D. C.

## BOYS Get a Good Stem Winding Watch FREE

You get 10 subscribers to a \$1.00 paper for 6 months at only 20 cts. each. You send us the 10 names and addresses and \$2.00 and get the watch. Perfect time guaranteed for 1 year. Full outfit free.

Address,

AMERICAN HORSE-POWER.

315 Dearborn Street, Chicago.

E. C. WILEY,

Mechanical = = =

= = = Engineer,

Office 811-1-2 Main Street,

Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.



Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING Co., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

## "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O.....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.



# *The Inventive Age*

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,

WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as and class matter.

WASHINGTON, AUGUST, 1903.

### Lists of Inventions Wanted.

Just who originated this plan of producing inventions by hot-house methods, the writer cannot say. This is unfortunate, for whoever he was, he did more to stimulate inventions along certain lines than anyone within the realm of knowledge. Patent attorneys who have profited by this scheme of encouraging inventors owe him a debt of gratitude. On the other hand, inventors should hold him in execration. The opinion of the officials of the Patent Office, whose bureaus have been overloaded with applications where there was no dearth before, would not be complimentary to the memory of the originator of the lists.

The sending out of "lists of inventions wanted" reached its height at the time that Wedderburn was at the summit of his career. Then, it was not an uncommon thing for certain concerns to send out schedules containing the names of a thousand different things that were alleged to be badly needed. Some of the inventors got the idea that the United States government had authorized such lists, and that the government wanted the inventions and had offered prizes therefore. Others obtained the impression that manufacturers had publicly proclaimed their need for certain inventions, and that the attorneys in sending out such lists were actuated by a high-minded purpose in disseminating the information. It seems almost useless to add that these speculations and suppositions were and are erroneous.

In commenting on the sending out of such lists by Wedderburn, Mr. Commissioner Butterworth, in his decision in the disbarment proceedings, stated:

"The respondents or their employes doubtless went to the Patent Office and read the various classes of inventions and selected and numbered them, and then published in effect in their literature that there were, to the knowledge of respondents, *one thousand inventions wanted*, and suggested in effect that there is wanted an improve-

ment in each one of the arts mentioned; and they further suggested, by inference, that there is now a pressing, active demand, of which respondents know, for these various improvements, and that there is a vast unoccupied field open for inventors to produce just what is wanted.

Counsel insists that the circular does not say so. Well, the argument is disingenuous, for the idea is intended to be conveyed to every mind that is capable of receiving an impression."

For a long time after that decision, patent attorneys were loath to follow the practice which had been tabooed by the Commissioner of Patents, and the sending out of the lists languished. Recently, however, certain attorneys have started the practice again, and are publicly advertising that they will send lists of inventions to anyone for the mere asking. No self-respecting attorney cares to pursue such methods of securing business. The Patent Office ought to look into the matter and protect inventors against such sharp practices on the part of attorneys.

If a person should take up one of those "lists of inventions wanted," he would find that almost at the top appears "a non-refillable bottle," yet it is a pretty safe guess that between three and four hundred patents have been granted in this class, and all because the impression has been spread broadcast that a non-refillable bottle is wanted.

The alleged demand for a non-refillable bottle was started by an offer said to have been made by a party named Pepper, in Kentucky, for a bottle which could not be refilled. He was a whiskey distiller, and wanted a bottle which could not be refilled by the barkeeper after he had emptied it. Pepper has long since gone out of business, and the offer which he may have made is therefore void, but this does not deter certain attorneys from including in "lists of inventions wanted" a non-refillable bottle.

In reading such lists, one would think that no patents had been issued in the specific classes referred to. If an investigation were made and the truth known, it would be found that there are scores of patents granted on each of the inventions included in the lists. These lists have been characterized by some as "Lists of Fees Wanted," and it would seem that such designation more accurately accords with the purposes of those responsible for the preparation of the schedules, than the usual heading employed.

There is hardly an attorney practicing before the Patent Office who does not occasionally get a letter from an inventor asking him to send a "list of inventions wanted," showing that there is a widespread belief that such lists are bona fide, and that manufacturers are waiting for the production of certain inventions and willing to pay a reward for them. It is cruel to deceive inventors by such methods, and attorneys who foster the impression that certain inventions are wanted, either by the government or the public, should not be permitted to practice before the United States Patent Office.

It is idle to say that such lists simply mean that if a man should in-

vent a good thing, it could be sold on the market at a profit. Such, however, is not the impression conveyed to the mind of the reader. As stated by the late Commissioner Butterworth, such lists suggest by inference that "there is a constant, pressing, active demand for the various improvements specified in the lists, and that there is a vast, unoccupied field open for inventors to produce just what is wanted."

Inventors therefore are warned to pay no attention to such lists. They are prepared simply in the interests of the attorneys who circulate them. They are misleading and disingenuous, and the attorneys who send out such lists are not the proper ones to have any dealings with before the United States Patent Office. There is no active, pressing demand for the inventions enumerated in the lists, and no one knows this better than the persons who have prepared and who are circulating said lists.

Furthermore, inventions which are produced by such methods are usually not worthy of being patented. What does an ordinary inventor know about the problem of refilling a bottle? He might construct a device which would prevent the bottle from being refilled by ordinary methods, but not having practical knowledge of glass manufacture, he would most likely construct a bottle which could not be molded or blown. Or, not having a knowledge of the various deceptions which are practiced, and the ways and means by which bottles can be refilled, he might construct a device which would not take into account the extraordinary schemes to refill bottles. The fact is that inventors, before they attempt to make an invention, ought to fully consider what the problem is that must be overcome, and should endeavor to construct the device so that it may be easily manufactured by ordinary means, and without increasing the expense of the original article. If inventors would confine their inventions to fields within which they are versed, or have knowledge, they would not need the stimulus produced by examining some fake lists, in order to produce an invention which would be worthy of patent protection.

### NEW BOOK.

#### RADIUM.

And other radio-active substances: polonium, actinium, and thorium, with a consideration of phosphorescent and fluorescent substances, the properties and applications of selenium and the treatment of disease by the ultra-violet light.

BY WILLIAM J. HAMMER,  
Consulting Electrical Engineer.

Price \$1.

D. Van Nostrand Company, New York, N. Y., 1903.

This is a lecture delivered at a meeting of the American Institute of Electrical Engineers and the American Electrochemical Society of New York, N. Y., on April 17, 1903.

The author of the paper has endeavored to exemplify certain fundamental principles connected with the phenomena upon which he has treated; and in considering these subjects, all of which may be said to be on the

borderland of science, to bring out by means of experiments, lantern slides and illustrations which accompany the paper, the practical and commercial side.

The book contains 38 illustrations, and treats of fluorescence; phosphorescence; radium, polonium, actinium and thorium: the properties and applications of selenium; and the treatment of disease by ultra-violet rays.

### Design Patents.

There has been a radical change both in the law and practice relating to design patents within the last year, such change being due to certain decisions of the United States Circuit Courts of Appeals criticising the Patent Office for issuing design patents on mechanical inventions. The particular decision which started the reform in the practice is entitled *Rowe vs. Blodgett & Clapp Company*, in which case the court held that a design patent granted on a horseshoe calk was invalid, because the shape of the device was designed merely to enhance its mechanical utility, and not for the purpose of display or ornamentation. In the April 1902 AGE we printed the syllabus of the decision.

For many years, the Patent Office followed the practice of granting design patents on articles of manufacture having a different form or configuration, the officials interpreting the word "useful" in section 4929 of the Revised Statutes, under which design patents were issued, to refer to articles intended for mechanical use. As a result, a large number of design patents were granted; and inventors flooded the Patent Office with applications seeking protection under the design patent laws for various mechanical inventions, because of the fact that the expense was less, and the protection seemed as good for many simple devices, as mechanical patents.

Since the aforesaid decision of the courts, the design law has been amended so as to omit the word "useful," and to permit "any person who has invented a new, original and ornamental design for an article of manufacture" to obtain patent protection thereon as a design. The law is being rigidly interpreted by the Patent Office at the present time. It has been held that the doctrine of double use applies to designs as well as to mechanical inventions, and that to be patentable, a design must involve an exercise of the inventive faculty. It follows, then, that only those designs which appeal to the aesthetic emotions will be protected by the Patent Office under the design patent law. For instance, such productions as are originated solely with reference to artistic ornament, and this embraces any ornamental or decorative design, superficial ornamentation for such articles as knives, forks, spoons, dishes, as well as patterns or designs for wall paper, fabrics, and the like. The design must be distinctively new and original, and must not be a mere copy from some existing object.



### State Laws Concerning Patents.

The power of a state or municipality to place restrictions upon the manner in which patents should be assigned and sold, has never been squarely brought before the United States Supreme Court, with the result that much conflicting legislation has been enacted by different states.

The right of property in letters-patents exists by virtue of federal laws exclusively, and one incident of such right is the right to sell the patent anywhere within federal jurisdiction. Hence, it has been declared that state statutes, which impose conditions upon the sale of patents, as by requiring the patent to be registered, are unconstitutional and void. Such conditions are regarded as curtailing and nullifying the federal laws, and the imposition of punishment for non-compliance, as an attempt to punish the patentee for doing what Congress has authorized him to do. This line of reasoning has not, however, been universally adopted. Some courts regard such conditions in the light of proper police regulations, and hold that so long as they make no discrimination against any class of citizens, and place no restriction upon commercial intercourse, they do not infringe constitutional rights. The weight of reason and of authority are decidedly against the validity of the statutes.

State legislatures may likewise enact statutes whose effect is to pass the title to letters-patent, and state courts may hear and determine questions arising out of contracts whose subject matter is patent rights, but may not settle questions as to the validity of the patent rights. Nor can a state legally impose a tax upon patent rights, nor upon the capital stock of corporations invested in patent rights.

Emphasis has been laid upon the distinction between control of the letters-patent and control of the patented articles. It is generally recognized that as property, patented articles are not under federal jurisdiction, and may be subjected to control and taxation by the states, so far as such control is not repugnant to other recognized principles of law. Congress never intended that the patent laws should displace the police powers of the states, by which the health, good order, peace and general welfare of the community are promoted. Whatever rights are secured to inventors are merely in exclusion of the rights of others, and must be enjoyed in subordination to the general authority of the state over all property within its limits.

*E. Bement & Sons vs. The National Harrow Company* 101 G. 888. *Patterson vs. Kentucky* 97 U. S. 501. *Webber vs. Virginia*, 103 U. S. 344. *Reeves vs. Corning* 51 Fed. Rep. 784. *Bloomer vs. McQuewan* 14 How. 539. *In re Bresnahan* 18 Fed. Rep. 65. *Ex parte Robinson* 2 Bliss 314. *Hollida vs. Hunt* 70 Ill. 110. *Crittenden vs. White* 23 Minn. 24. *Cranson vs. Smith* 37 Mich. 309. *Wilch vs. Phelps* 14 Neb. 134. *State vs. Butler* 3 Lea Tenn. 222. *People vs. Russell* 25 O. G. 504. *Jordan vs. Dayton* 4 Ohio 310. *Mason vs. McLeod* 57 Kan. 105. *New vs. Walker* 108 Ind. 365. *Hockett*

*vs. State* 105 Ind. 250. *In re Sheffield* 04 Fed. Rep. 833. *People vs. Neff* 15 N. Y., App. Div. 8. 19 N. Y. *Vannini vs. Paine* 1 Harr. Del. 68.

There are in several states, statutes requiring notes, whereof the consideration is a patent right, to contain the words "given for a patent right." The courts are not in agreement as to their effect or validity.

The following authorities favor the constitutionality of these Acts. *Herdic vs. Roessler* 109 N. Y. 127. *New vs. Walker* 108 Ind. 365. *Hankey vs. Donney* 116 Ind. 118. *Breechbill vs. Randall* 102 Ind. 528. *Haskell vs. Jones* 86 Pa. St. 173. *Tod vs. Wick* 36 Ohio St. 370. *Tilson vs. Gatling* 60 Ark. 114. Other courts have held provisions of this character unconstitutional, as interfering with the exclusive right of Congress to legislate with regard to patents. *Woolen vs. Banker* 2 Flipp 33. *Castle vs. Hutchinson* 25 Fed. Rep. 394. *Hollida vs. Hunt* 70 Ill. 109. *Helm vs. Huntington* First National Bank 43 Ind. 167. *Crittenden vs. White* 23 Minn. 24. *Cranson vs. Smith* 37 Mich. 309. *Wilch vs. Phelps* 14 Neb. 134. *State vs. Lockwood* 43 Wis. 403.

In the latest Supreme Court case, *Bemet & Sons vs. National Harrow Company*, the court held: "That in certain circumstances the sale of patented articles may be controlled within the several states by a legitimate exercise of their powers over their purely domestic affairs, whether of internal commerce or police regulation, and that this is not an interference with the right conferred by the patent." This decision affirmed the doctrine announced in *Patterson vs. Kentucky*, supra, and while it seems to be settled that a state, under its police authority, may regulate the sale of a manufactured article covered by a patent, it is clearly indicated in the cases of *ex parte Robinson*, supra. *Webber vs. Virginia*, supra, that property in inventions exists by virtue of the laws of Congress, and that no state has any right to interfere with this enjoyment or annex conditions to the grant. It would appear to be perfectly reasonable to assume that the Supreme Court of the United States would declare all such statutes to be unconstitutional, which place restrictions upon patentees in assigning or disposing of patents.

### A Boy's Clock.

Acting on the very safe theory that clockwork has an irresistible fascination for boys, a toy has been put on the market that boys may take to pieces and put together again to their heart's content. In this way, they are amused and instructed, taught how to regulate and treat a clock, how to hang it, how to clean it, and how the swing of a pendulum serves to measure time. The clock is sent in a dissected form, in twenty four parts, the wheels mounted on card board, the weight, hands and pendulum neatly wrapped in tissue paper, the framework ready to receive the wheels. With the aid of the instructions and drawings that accompany the mechanism, the parts can be easily adjusted. It is put together merely by four wire pins, with a wood frame and a five-inch dial; but the essential parts are so nicely fitted and so rigid, that it keeps excellent time, thus serving a more permanent purpose than the amusement afforded by a toy. It is, however, as a means of technical education that it has been brought out, and on account of opportunity for instruction afforded, as well as the interest it inspires and the practical use to which it can be put, it promises to be most successful.

### Mountain Air in Cities.

In view of the increasing attention paid to the treatment of consumption—the realization of the ravages of the "white death"—and the success following the experiments in the "open air" cures—it is of interest to note that when it is impossible to remove the patient to the mountains, mountain air can be brought to the cities. There is in London an institution called the Oxygen Hospital, which has special arrangements for the cure of tuberculosis, ulcers, lupus, wounds, etc. Cubicles are constructed—six and one-half feet long, four feet wide, and six feet high, and elevated on blocks about a foot above the floor; and in these compartments, consumptives may sleep and spend the greater part of their time in an atmosphere artificially adapted to their necessities. The cubicles are provided with a scientific mechanism by which the air is dried, filtered, ozonized and rarefied before it reaches the patient.

The walls of the compartments are of wood and plate glass, and the doors are air tight, closing with a joint. Opposite the doors and attached to the wood is the small chamber where the air is treated. The outer air, when drawn by a ventilating shaft into the chamber, is filtered through layers of cotton wool, to remove all impurities; it is then dried by being passed through perforated trays charged with chloride of calcium, and finally, ozonized by means of an Andriolis tube, which is called into action for 5 minutes in each quarter of an hour by automatic clockwork. Above the doors is a square chamber containing the exhaust fan, and there is a ventilating shaft leading therefrom through the roof of the hospital. As the output is regulated so as to exceed the inlet, the atmospheric pressure within the cubicle is somewhat reduced, and the air is rarefied.

The patient spends some 16 out of every 24 hours in his cubicle, and it said that instead of being cramped by his narrow surroundings, he is unwilling to leave them, as he finds it much easier to breathe there, and correspondingly difficult outside.

The cubicle, after the initial expense of construction has been covered, is not costly in operation. The cubicles at the London Oxygen Hospital, for instance, cost about 25 cents a day each in chemicals.

### Cork Barrels.

It has occurred to a Frenchman to manufacture barrels intended for transporting and storing wine, from cork, which, being a poor conductor of heat, is especially adapted for this purpose. The barrels, naturally, are lined with thin metal; and the inventor claims that it will not be necessary to add alcohol for preserving purposes, when cork is used in their manufacture. As the staves will not warp, the receptacles would be of value in hot climates, for the transport of perishable goods, such as ice, meat, fish, fruit, etc. There would also be a notable saving in freight, as a barrel of cork weighs only about one third as much as a wooden barrel of the same capacity. Cork barrels, it is said, can be made at a reasonable price in France, as cork is plentiful in Algeria, a French protectorate.

### Coating Iron with Zinc.

A Russian chemist, Professor Emanuel Goldberg, of Moscow, Russia, has patented in this country a new process of electrolytically coating iron with zinc, the improvement consisting in adding to the electrolyte used an organic compound containing nitrogen.

The known methods for electrolytically coating iron with zinc have not given satisfactory results, as the metal coating obtained in this manner either is deposited in a form which is not white or adheres badly to the surface to be electroplated. By the present invention, however, a pure white coating of zinc which adheres well to the surface of the iron is obtained.

The invention for this purpose consists in adding to the electrolyte, wherein the iron is to be coated, a compound containing nitrogen bound to an organic radical. Suitable compounds are amines, amides, cyanides, nitriles, or like compounds in which the nitrogen is attached directly or indirectly to an organic radical. The pyridin bases have given the best results.

### Danger from Electric Shock.

Cases of fatal electric shock are, fortunately, of rare occurrence, and are mostly confined to those employed in the generation and distribution of electricity. It is difficult to ascertain the minimum strength of current which is dangerous to life, as there is so much variation in the effect according to the circumstances attending the shock. Currents of 30 to 40 milliamperes are probably as much as can be borne without great discomfort, although we find it stated that for medical purposes, and, of course, with due precautions, as many as 200 milliamperes can be safely passed through the human body. The effect is, however, modified so much by the state of health of the individual, by the length of time during which shock has been inflicted, and by the path which the current has taken through the body, that no definite safe limit can be positively laid down.

As a general rule, the resistance of the human body is normally so high that with pressures not exceeding 500 volts accidental contacts are rarely fatal shocks, although occasionally the portions of the body on which contact is made are severely burnt. The few fatal accidents which have occurred at low pressure appear to have been attended by a body resistance far below that usually met with. The effect of a shock may also be to cause such muscular contractions that the victim is unable to let go of the conductor which he has grasped, and, if help is not at hand, death may result from the prolonged application of a current which, if it had been only momentary, might have been comparatively harmless. On the other hand, there are on record cases of shock at pressures of several thousands of volts in which death has not resulted.

The ultimate cause of death, when due primarily to electric shock, is generally considered to be stoppage of the action of the heart or of the respiratory organs. That the latter may be affected is shown by the fact that victims of electric shock are sometimes brought to by practice of some of the well-known methods of artificial respiration. The cessation of the heart's action may be due to stimulation of the nerves which control the beating of the heart; these, when stimulated to excess, may cause the heart to stop altogether.—*Cassier's Magazine*.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued June 30, 1903.

### MECHANICAL PATENTS.

Continued from July number.

Carbon compounds. Obtaining. K. C. Wideen  
Carpenter's gage. L. Shireman  
Carpet stretcher. H. Ripley  
Carriage. Baby. T. Murray  
Carriage spring. L. G. Mayer  
Carriage top valance. R. C. Schemmel  
Cart. Ash. F. C. W. Stelter  
Cart. Double dump. T. Sunderland  
Cement. Apparatus for construction of buildings of. C. G. Canfield  
Cement. Composition of painting. J. Senft  
Centrifugal machine. G. Pott et al  
Chain hook. Watch. C. H. Kuescher  
Chair. J. G. Hallstrom  
Cider press. E. R. Bowman  
Cigar box or similar receptacle. E. C. Thurnau  
Cigar pipe. W. Assman  
Cigarette cutting mechanism. J. Wojciechowski  
Circuit breaker. 2 pats. H. P. Ball  
Cisterns, &c. Form for. G. G. F. Boswell  
Clamp. J. Black  
Clamp. J. W. Marshall  
Clip. L. Steinberger  
Clothes line clamp. O. H. Grosland  
Clutch. G. A. Ede  
Clutch device. P. Diehl  
Coaster brake. F. Schmitz  
Cock. Time controlled gas. H. H. Ward  
Coffer dam. T. A. Dungan  
Coin controlled apparatus. J. C. A. Riecke  
Coke conveyer. Hot. M. Graham  
Coking kiln. C. W. A. & J. Mettler  
Column and beam. Composite. W. N. Wight  
Comb. J. L. Gillum  
Compasses. Locking. F. J. McCabe  
Composite material. A. Leisel  
Concrete making machine. G. S. Tiffany  
Concrete structure. A. A. Firestone  
Condiment holder. Pulverizing. C. B. Overbaugh  
Corn husking machine. L. D. Swart  
Corn husking machine roller. L. D. Swart  
Corn sheller. A. H. Patch  
Corset. J. Schuffly  
Corset. Abdominal. C. H. Schopbach  
Cotton handling machinery. J. R. Fordyce  
Cotton picker. J. Griffin  
Cotton picker. H. Wiswall, Jr.  
Crab shell cleansing apparatus. J. W. P. Insley  
Crate. Folding egg. S. M. Hunt  
Crayon molding machine. W. F. Hanson  
Crib. Folding. M. C. Collier  
Cuff holder. C. H. Leach  
Cultivator and harrow. Combined. H. C. Farris  
Curtain and shade support. Adjustable. G. W. Murphey  
Curtain hanger. J. S. Hamilton  
Curtain pole bracket. Adjustable. G. Quackenbush  
Curtain stretcher lock and hinge. R. S. Corlett  
Cutting out press. F. B. Morris  
Damper. Fireplace. M. E. Stokes  
Decorative device. J. Braun  
Dental engine. J. B. Wantz  
Dental forceps. K. Felsch  
Dental medicine receptacle. G. B. Smith  
Dental plugger. A. Bush  
Depilatory and making it. A. H. Stone  
Detector bar. J. T. Hambay  
Dials. Device for protecting combination. H. Lietz  
Dimensioning apparatus. B. M. W. Hanson  
Distillers' wash. Treating. C. G. Sudre et al  
Door check. Liquid. C. H. Ocmupough  
Door lock and alarm device. W. N. Greer  
Door. Screen and storm. M. F. Byrne  
Door water shed. Cellar. T. K. Clark  
Draft equalizer. F. B. Stout  
Dredger. W. H. Fulcher  
Drier. A. Schoellhorn et al  
Drum. Heating. A. C. Selleck  
Dust pan. M. Rice  
Dye and making same. Blue sulfur. I. & H. Levinstein  
Earth breaking apparatus. W. Cole  
Eccentric. M. Topf  
Egg case. R. W. Hurd  
Electric controller. J. A. Little  
Electric generators. Automatic regulator for. W. A. Turbayne  
Electric generators. Automatic regulator for. W. A. Turbayne et al  
Electric heater. G. C. Hawkins  
Electric light shade and reflector. O. A. Mygatt  
Electric machines. Maintaining synchronous rotation of dynamo. E. W. Rice, Jr. et al  
Electric machines. Means for maintaining synchronous rotation of dynamo. E. W. Rice, Jr. et al  
Electric meters. Compensating friction in. F. P. Cox  
Electric motor. P. Swan  
Electric motor controller. E. R. Whitney  
Electric motor friction gear. J. B. Wantz  
Electric signal. G. F. Hilton  
Electric switch. T. O. Chouinard  
Electric switch. I. G. Waterman  
Electrical switch. H. P. Ball  
Electrical motor. H. Rowntree  
Electrical transformers. Automatic cut out device for. D. C. Conkling  
Electrode. W. R. Chipman  
Electrolytes. Applying heat to. C. F. Burgess et al  
Electromagnet. C. A. Brust  
Elevator mechanism. A. Cowperthwait  
Elevator safety device. Electric. G. T. Rennerfelt  
Engine igniter. Internal combustion. H. G. Mears et al  
Engraving. Machine. M. Barr  
Engraving machine. R. Trentsch  
Eraser. Rubber. F. A. Schultz

Excavating mechanism. W. Cole  
Exhibit frame for lace draperies. G. J. Bicknell  
Extension table. H. Johnson  
Eyeglasses. W. A. Vescelius  
Eyeglasses. Pendent lens. G. F. Applegate  
Fan. Foot power. F. Marak  
Fans. Electric motor for ceiling. P. Swan  
Fans or other objects. Oscillatory support for. J. Devine  
Feed water heater. R. H. Hornbrook  
Feed water system. D. W. Patterson  
Feeder. Calif. I. H. Hall, Jr.  
Feeding mechanism. F. B. Pease  
Fence machine. Wire. A. J. Bates et al  
Fence post. J. G. Wait  
Fence post. S. F. Webb  
Fence post. Cement. A. P. Robertson  
Fence. Postless wire. M. H. Starling  
Fence stay fastener. Wire. C. Kanavel  
Fence wire staple. R. A. Winters  
Fiber cutting machine. Wood. G. L. Weller  
Fifth wheel. C. A. Hennicke  
File and binder. Paper. M. D. Kenyon  
Filter. J. F. Wittenmann  
Filter. Oil. B. L. Scott  
Fire escape. W. H. Logan  
Fire extinguisher. Automatic. F. M. Allen  
Fires. Extinguishing. A. H. Van Riper et al  
Firearm. M. Goss  
Firearm ejector. G. E. Humphreys  
Firearm sight. L. R. Hepburn  
Firearm. Single trigger. J. A. R. Elliott  
Firearm. Sub-caliber. G. H. Garrison  
Fireproof construction. W. N. Wight  
Fireproof floor. W. N. Wight  
Fireproof floor and constructing same. W. N. Wight  
Fireproof floor construction. W. C. Lewis  
Fish cutting and cleaning apparatus. A. R. Rogers  
Flax stock and preparing same. B. C. Mudge  
Float. Electrical contact controlling. I. G. Waterman  
Flour and lard rubbing machine. T. Westerman  
Flue expander and cutter. A. Nault  
Flushing apparatus. C. N. Marcellus  
Flushing apparatus. R. P. Jones  
Fly escape. Window screen. E. L. Hereford  
Folding box. Z. B. Webb  
Folding carrier. W. J. Best  
Foot cleaner or door mat. Mechanical. A. Preuss et al  
Fork. J. O. Cochran  
Formaldehyde generating apparatus. E. F. Billings  
Fruit. Desiccating. W. S. Keyes  
Fuel and making same. Artificial. E. C. May  
Furnace. G. T. Wyatt  
Furnace controlling apparatus. Smoke consuming. H. Kowitzke  
Furnace firing machine. J. U. Hobbs  
Furnaces. Apparatus for feeding fine fuel to. J. E. Baldwin et al  
Furrow opener attachment. C. S. Kemper  
Game. C. L. Durboraw  
Game apparatus. C. J. McLeod  
Garment clasp. T. P. Taylor et al  
Garment. Nether. C. E. Taylor  
Garment supporter. S. G. Ginner  
Gas burner. L. F. Knoderer  
Gas burner. J. J. Johnston  
Gas burner. Automatic. C. A. Haas  
Gas burner heating attachment. W. A. Koneman  
Gas cut off. Automatic. J. E. Seymour  
Gas engine. W. J. Wright  
Gas meter. Inferential. T. Thorp  
Gate. G. H. Smith  
Gearing. Compensating. H. L. Warner  
Germicide generator. F. MacFarland  
Girders or beams. Cambering or straightening device for. W. M. Burdon  
Gold. Extracting. T. B. Joseph  
Gold separator. B. Westhaver  
Golf club. 2 pats. F. W. Taylor  
Governor and reversing mechanism. Gas engine. E. Loker  
Governor. Marine engine. G. F. Lasher  
Grain bin. G. M. Moulton et al  
Grain binder breastplate stripping device. E. A. Johnston  
Grain cleaner and distributor. J. Wilhelm  
Grain drier and cooler. Rotary. A. Johnson  
Grain drill. C. A. Hardy  
Grain elevator and weigher. C. Bradford  
Grain separator. J. E. Mitchell  
Grain treating apparatus. A. S. Stewart  
Grinding machines. Steady rest for. C. H. Norton  
Grinding or polishing machinery. D. L. Bisset  
Gun. Breakdown. C. F. Lefever  
Hair clamp. W. J. Koenig  
Hammer. Automatic. A. Stromdahl  
Hammer feeding device. Forge. P. R. Peiseler  
Harrow. A. W. England  
Harrow. J. O. Avery  
Harvester. Grain. G. L. Phelps  
Harvesting machine. Corn. J. W. Primmore et al  
Harvester machine platform supports. Adjusting mechanism for. J. Macphail  
Hat bodies. Machine for forming napped hats for. A. B. Waring  
Hat body felting machine. J. Leonard  
Hat fastener. A. F. Malmstead  
Hat forming block. J. W. Brown  
Hay rake cleaner. Wheeled. J. Macphail  
Heddle bar wear protecting means. W. Barber  
Hinge. Spring. W. L. Evans, Jr.  
Hog holding device. J. S. Alexander  
Hoist apparatus scraper attachment. S. E. Leonard  
Hoist controller. Electric. P. J. Darlington  
Hoisting and conveying apparatus. L. S. Austin  
Hoop. N. K. Bowman  
Hose attachment. W. G. McKay  
Hose coupling. J. P. Muehlebach  
Hose coupling. H. Wichermann et al  
Hose coupling. W. R. Amos  
Ice box or refrigerator. F. C. Pershing  
Igniter. Electric. 2 pats. A. F. Gauz  
Igniter. Electric. H. G. Mears et al  
Igniter generator. L. J. Le Pontois

Igniter generator. Electric. L. J. Le Pontois  
Illuminating canopy. F. L. O. Wadsworth  
Index. W. H. Gilman  
Indicator. 2 pats. T. J. McGrath  
Induction motor. A. E. Averett  
Insect catcher. G. I. Silveira  
Insulating system for electric transmission circuits. A. W. Underwood  
Insulator. High tension current. K. S. Lemstrom  
Internal combustion engine. A. F. Evans  
Ironing board. L. W. Cyphers  
Ironing table. G. W. Clapp  
Jack. S. R. Tuggle et al  
Jar closure. J. H. Saunders  
Journal lubricator. W. F. Poyser et al  
Knitting machine. Warp and weft. 2 pats. G. T. Nicholls  
Knob alarm. Door. C. H. Ahlum  
Ladder. Folding. G. L. Gustafson  
Lamp. Electric arc. C. J. Toerring  
Lamp. Electric arc. R. Fleming  
Lamp for constant potential circuits. Electric arc. J. J. Wood  
Lamp. Gasolene. J. J. Flint  
Lamp. Incandescent vapor. G. Bohner  
Lamp rheostat. Arc. J. J. Wood  
Lamps. Switch for double filament electric. L. Lobenthal et al  
Lantern frame and blank for making same. A. L. Edwards  
Latch. H. W. Schiermeyer  
Lathe. T. Craig  
Lathe. S. C. Hills  
Lazy tongs construction. F. King  
Leaf holder for directories, &c. C. E. Napp  
Leather. Making patent. W. R. Smith  
Leather snipping machine. N. Hayward  
Leveling instrument. Automatic. J. W. Belyen  
Lifting jack. W. H. Cox  
Linotype machine. J. S. Thompson  
Liquid level indicator. L. Murphy  
Liquid purifying apparatus. G. D. Mitchell  
Liquid separator. Centrifugal. T. Collins et al  
Liquid temperature regulator. H. A. R. Dietrich  
Lister. S. H. Tinsman  
Lock. L. Neischl  
Locomotive sanding device. J. C. Hooper  
Log conveyer. S. F. Claypool  
Loom. J. C. Brooks  
Loom for weaving tufted fabrics. J. A. Clark  
Loom. Pile carpet weaving. H. Panitschek et al  
Loom shuttle checking mechanism. G. H. Parker  
Loom take-up motion. O. L. Owen  
Loom thread parting mechanism. E. S. Stimpson  
Lubricator. J. H. Walker  
Lunch box. L. Louis  
Mash. Apparatus for decomposing brewers' V. Lapp  
Massage machine. T. D. Ingram  
Massaging instrument. B. E. Joseph  
Match safe. J. De Bruin  
Medicine dropper. F. A. Liftchild  
Metal bars. Severing. W. B. Pearson et al  
Metal bending machine. W. Block  
Metal. Leaching. T. B. Joseph  
Metal working machine. L. F. & R. Schulze  
Metallic tie and rail fastener. V. C. Washbaugh  
Metallurgical furnace. 7 pats. M. P. Boss  
Milk jar lock. J. C. Betts  
Mill. H. C. Groves  
Mixing device. L. E. Shinn  
Molding flasks. Pressure apparatus for. J. Mills  
Molding machine. W. T. Clark  
Motor control system. G. H. Hill  
Motors. Collapsible vessel for atmospheric. W. M. Fulton  
Music leaf turner. E. Allison  
Music leaf turner. H. H. Hill  
Muzzle. Grazing. G. G. Banks  
Necktie shield. Reinforced. G. Flaskamp  
Nest. Trap. G. W. Brand  
Nut lock. G. J. Callahan  
Nut lock. L. Esser  
Nut lock. N. Newman  
Nut. Lock. A. Scholer  
Nut. Locking. A. T. Hughes  
Oil burner. Fuel. T. E. Flaherty  
Oil can. Druggist's dispensing. J. A. Dinkler  
Oil switch. H. P. Ball  
Ordnance. Gas check pad for breech loading. G. Gerdorn  
Ordnance. Semi-automatic breech loading. W. H. Bevans  
Ore concentrator. E. B. Rogers et al  
Ores. Leaching. G. E. Thede  
Package. R. P. Beatty  
Package tie. H. D. Jacobson et al  
Packing. Stuffing box. J. McCallum  
Paper, bags, or the like. Holder for piled slips or sheets of. W. Hudson  
Paper box. Folding. G. A. Hartman  
Paper box gluing mechanism. W. S. Scales  
Paper cutter attachment and book mark. Combined. C. J. I. Devlin  
Paper mill engine. C. S. Elder  
Paper or other fabrics. Machinery for cutting and folding. 2 pats. E. H. Cottrell  
Paper weight and pincushion. Combined. G. Alden  
Papers, plates, &c. Solution for use in the production of photographic. M. Jolles et al  
Pasteurizer. S. M. Barre et al  
Pedocycle. J. D. Schmidt  
Pegging machine. J. F. Davey  
Pen. Fountain. A. E. Schaaf  
Pen. Ruling or draftsman's. J. Fiedler  
Pencil. F. W. Musson  
Perforating machine. Electrically controlled. H. L. Davis  
Phase transformation. A. D. Lunt  
Photographic printing apparatus. H. H. McIntire  
Photographic purposes. Portable dark chamber for. J. Lambert  
Piano action. R. M. Hutchinson  
Pianoforte keyboard. F. L. Harmon  
Piano with auxiliary harmonic sounding board. F. W. Krinkel  
Pick fastening. R. Wheeler  
Pipe jacket. Steam or air. R. Holden

Pile fabrics. Device for cutting double. O. Hallensleben  
Pipes. Repair sleeve for fluid conducting. S. R. Dresser et al  
Planter. Corn. A. B. Frenier  
Planter. Seed. J. L. Phelps  
Plants of their fleshy substances. Machine for divesting parts of. H. J. Boeken  
Pliers for clamping clips on wires. W. J. Baker  
Plow. P. J. Johansson et al  
Plow and cultivator. Combination adjustable. W. H. Fox  
Plumb, rule, and level. A. T. Binkerd  
Poke. Animal. J. S. Weathers  
Polishing machine. H. Schuessler  
Pool table register. G. C. Beck  
Post office assorting case and table. M. S. Field  
Potato picker. C. W. Bly  
Power translating device. G. W. Marble  
Power transmission and control. J. B. Entz  
Power transmission mechanism. J. Dring  
Power transmitter. E. B. Allen  
Power transmitting device. C. W. Hunt  
Precious stones. Cutting. E. G. H. Schenck  
Precious stones. Machine for cutting. E. G. H. Schenck  
Printing apparatus. Stencil. D. Gestetner  
Printing block. J. H. Swain  
Printing machine delivery mechanism. W. Spalckhaver  
Printing press. S. G. Goss  
Printing press. D. I. Eckerson  
Projectile. E. M. Johnson  
Propeller. Self clearing. C. H. Lee  
Protective composition. Applying. O. A. Stempel  
Pulley. H. T. Hollowell  
Pulverizer. Soil. B. L. Lambert  
Pump operating mechanism. G. A. Gemmer  
Pump. Rotary. E. Patterson  
Pump. Valveless. L. S. Chapman  
Pumping device. Air and water. D. Vaniman et al  
Punch. Belt. D. T. Allen  
Punching bag and support. G. S. Maxwell  
Punching machine spacing table. J. Christie  
Racing hurdle. R. P. Traxler  
Rail brace. D. D. Quenell  
Rail joint. F. Melan  
Rail joint. B. Wolhaupter  
Rail sander. J. C. Thompson  
Rails. Foot blocking for guard. A. R. Bowers  
Railway. Electric. A. H. Bedworth  
Railway. Electric. E. C. Boynton  
Railway line sleeper. A. Olivier  
Railway rail joint. T. Powell  
Railway rail track bridge. O. Haase  
Railway switch operating device. C. A. Hendel  
Railway switches and signals. Operating and locking device for. B. Lindh  
Railway tie. J. Beasley  
Ratchet wrench. A. Donavan  
Receptacles. Insertible closure for liquid. G. H. Klemm  
Recoil check. Fluid. A. T. Dawson et al  
Refrigerator. Reissue. M. Bensinger  
Refrigerator car. H. F. Stanley  
Rendering lard. W. B. Allbright  
Rest. Folding. M. Rosenberg  
Ring. M. L. Weiss  
Ring guard. J. Fallek  
Ring tray. B. Leuzen  
Rolling mill. R. D. York  
Rotary engine. R. Foster  
Rotary engine. E. J. Beakley  
Rotary engine. T. M. Andrews  
Rotary fluid pressure engine. B. Draper et al  
Rowing apparatus. J. L. Burton  
Rubber glove. Seamless. C. A. Lindsay  
Ruler and adding device. Combined. H. L. Haskell et al  
Safe. T. Scott  
Safety hook. F. Lynx  
Sampler. Liquid. G. S. Dyer  
Sandpapering machines. Automatic yielding pressure bars for. 2 pats. C. C. Stuart  
Sash bar. Greenhouse, &c. reissue. P. M. Pierson  
Sash. Tongued. E. Hipolito  
Saw frame stretcher. C. J. Novak  
Sawmill. H. S. Mitchell  
Sawmill carriage offset mechanism. A. J. West  
Scaffold bracket. Folding. G. A. Pierce  
Scraper and grader. N. Dreis  
Seal lock. 2 pats. W. L. Sebring  
Sealing device. Bottle. W. C. Wiederseim  
Seed cleaner and separator. C. N. Hatfield  
Self waiting table. J. Shafer et al  
Sewing machine. S. M. Jacoby  
Sewing machine hemmer. J. Douglas  
Sewing machine. Hemstitch. A. J. A. Oesterreich  
Sewing machine. Overseaming. W. H. Stedman  
Sewing machine tension releasing and restoring device. J. G. Greene  
Sewing machine thread guide. W. H. Stedman  
Shackle. H. G. Judd  
Shafts. Compound sleeve for flexible. A. Janet  
Shingle bracket. N. Weber  
Ships bottoms. Apparatus for cleaning. C. Johnson  
Shoe plug. Detachable. L. B. Cahill  
Shredding machine feed mechanism. F. M. & W. R. Tegarden  
Shutter worker. A. M. Burnham  
Shutter worker. N. O. Bond  
Shuttle. L. V. Martel  
Signaling system. H. G. Brown  
Silicon and aluminium from silicates of alumina. Manufacture of. C. H. Homan  
Sine wave extractor. H. H. Hollender  
Sink. Camp. G. B. Donavin  
Smelting plant. W. E. Koch  
Snow plow. P. J. Lunden  
Soldering machine. Can. C. H. Ayars  
Sound reproducing machine. E. D. Gleason  
Spark plug. W. Barber  
Spectacle holder. R. M. Grooms  
Spectacles. J. S. Baker



Spinning machine. Ring.... N. N. S. Daudelin  
 Spinning spindle..... R. Fair  
 Spinning spindle plumbing device..... A. E. Rhoades  
 Splicing tool..... D. E. Wiseman  
 Sprayer, Hand..... G. W. Lisk  
 Spring wheel..... C. C. Kelley  
 Spring wheel..... C. J. Zillgitt  
 Stalk cutter and crusher..... R. B. Ellison  
 Stall, Portable..... D. Stitzer  
 Stamp, Hand..... E. M. Tilden  
 Stamp, Hand..... C. Hansen  
 Stamp, Marking..... G. D. Strayer  
 Steam generator..... F. M. Faber  
 Stencil sheet..... A. D. Klaber  
 Still column..... E. Guillaume  
 Stocking, Seamless fashioned..... J. F. Bard  
 Stone, Artificial..... J. A. Bell et al  
 Stone for building piers, dry docks, breakwaters, &c. Apparatus for making artificial..... F. B. & C. H. Umstead  
 Stop motion..... G. A. Martin  
 Stove..... C. E. Hill  
 Stove, Gas or vapor..... H. B. Tatham, Jr  
 Striking bag disk support..... W. J. Cunningham  
 Stuffing box..... F. E. Fredericks  
 Suspenders..... G. H. Edgerton  
 Swimming apparatus..... J. J. Gallagher  
 Swing..... C. O. Lyman  
 Tanning apparatus..... C. P. Kerans  
 Tap, Barrel..... A. Schneider  
 Teaching apparatus. Gun practice..... C. A. Sporrang  
 Telegraphic transmitter..... H. G. Martin  
 Telephone..... F. C. Redfield  
 Telephone hook switch..... E. B. Fahnestock  
 Telephone system. Central energy..... K. B. Miller  
 Telephone system. Selective party line..... A. J. Springborn  
 Telephone transmitter..... M. Weissner  
 Telephone transmitter, 2 pats..... E. B. Fahnestock  
 Telephone transmitter and receiver..... O. P. Sammons  
 Telephone transmitter base..... E. B. Fahnestock  
 Terminal socket..... C. Leichtenschlag  
 Theatrical apparatus..... L. J. Couch  
 Thill or pole clip..... W. A. & D. P. Gillett et al  
 Threshing machine rope or cable drive..... G. E. Wilson  
 Tie plate..... B. B. Moss  
 Tire protector, Noiseless..... L. C. Cummings  
 Tire, Rubber..... E. B. Tragler  
 Tire, Vehicle wheel..... S. C. Lines  
 Tongs..... J. Morgan  
 Tongue, Vehicle..... H. H. Dreyer  
 Tool shanks. Means for holding cylindrical..... J. A. Coburn  
 Top, Spinning..... I. E. Stump et al  
 Toy..... L. M. Craun et al  
 Toy..... J. A. Doyle  
 Toy building blocks..... F. Thomsen  
 Toy, Mechanical..... C. J. Rehl  
 Track laying apparatus..... R. E. Hurley  
 Track sanding apparatus..... J. C. Hooper  
 Trains, System of control for electrically propelled..... E. A. Sperry  
 Trolley..... 2 pats..... J. H. Walker  
 Trolley..... G. E. Allen et al  
 Truck or car, Dumping..... S. E. Gladding  
 Trunk..... M. N. Drucker  
 Trunk..... M. V. Buraside  
 Trunk attachment..... G. Alden  
 Trunk, Cabinet..... R. T. Watkins et al  
 Truss, Hernia..... H. Loewy  
 Tube sheet protector..... C. H. Boone  
 Tunneling machine..... P. Unanue  
 Turnbuckle strain..... L. Steinberger  
 Type casting matrix..... T. Cleghorn  
 Type finishing machine..... W. J. Huston et al  
 Type writer..... N. L. Anderson  
 Type writing machine..... H. Cross et al  
 Type writing machine..... W. C. Farnum  
 Type writing machine..... F. W. Hillard  
 Type writing machine carriage mechanism..... H. Hill  
 Valve..... E. Walther  
 Valve, Controlling..... T. Reuter  
 Valve gear..... H. Lentz  
 Varnish and method of compounding..... D. Brazell  
 Vehicle frame and driving axle gear..... G. R. Boulding  
 Vehicle gear..... A. L. McGregor  
 Vehicle, Motor..... J. B. Ewer  
 Vehicle, Motor..... C. A. Hider  
 Vending machine..... M. C. Clemons  
 Ventilator..... T. A. Frame  
 Wagon box elevator and dumper..... A. Olsen et al  
 Wagon, Dust..... F. Loos  
 Wagon for oil, &c. Road tank..... T. Davies  
 Wagon, Weighing..... C. Skidmore  
 Warps, Harness finding machine for use in manually drawing in..... C. E. Smith  
 Washbench and ironing board, Combined..... A. J. Reinhardt  
 Washtub..... G. V. Blackstone  
 Washing machine..... W. W. Murphy  
 Watch barrel..... R. S. Settle  
 Water purifier..... C. L. Kennicott  
 Wattmeter for three wire systems, Prepayment..... G. G. Tilden  
 Weeding machine..... O. S. Fellows  
 Well drilling machine..... D. B. Martin  
 Whiffletree..... A. C. Scarr  
 Windmill regulator..... E. Wuerfel  
 Window..... B. F. Stark  
 Window cleaner..... W. Mable  
 Window brace fastener..... E. Carroll  
 Wire drawing machine stop mechanism..... J. H. O'Donnell  
 Wood holder..... W. J. Best  
 Wrench..... J. C. Osborne  
 Wrench..... J. H. Shepherd  
 Wrench..... C. C. Longard  
 Wrench..... D. F. Detamore  
 Yarn chains. Unwrapping mechanism for..... S. Pearce  
 Zither..... G. Huber

## DESIGNS.

Ammeter cover..... W. A. Price  
 Bottle..... J. Farnan  
 Box, Paper..... P. B. Myers  
 Brushes, mirrors, or similar articles, Back for..... 2 pats..... O. Leigh et al  
 Brushes, mirrors, or similar articles, Back for..... 2 pats..... P. O. Dickinson

Furniture support..... 3 pats..... J. Fay  
 Knives or similar articles. Handle for..... H. Hillbom  
 Medallion..... 3 pats..... W. A. Malliet  
 Radiator section..... R. K. Story  
 Rheostat or controller cover..... W. A. Price  
 Spoons, forks, or similar articles. Handle for..... 5 pats..... H. Hillbom  
 Spoons, forks, or similar articles. Handle for..... F. E. Pretat  
 Spoons or similar articles. Handle for..... 3 pats..... E. Crees et al  
 Spoons or similar articles. Handle for..... J. E. Straker, Jr  
 Teapot or similar article..... E. Goetze  
 Textile fabric..... W. S. Friedlander  
 Tiling..... A. W. Koch  
 Type, Font of..... H. Ihlenburg  
 Water bag..... E. E. Menges

Issued July 7, 1903.

## MECHANICAL PATENTS.

Abrading tool compound..... K. Sakurai  
 Adjustable extension hanger..... H. S. Burley  
 Advertising device and street indicator. Electric..... R. D. Lampson  
 Air brake. Direct acting compressed..... W. K. M. Hildebrand  
 Air brake, Vehicle..... J. S. Smart  
 Air forcing device for ventilation or similar uses..... J. B. & J. Le Beau et al  
 Alternator..... C. A. Parsons  
 Amalgamator quicksilver feed..... J. W. Swearingen  
 Anode mold. Tilting..... F. A. Thum  
 Atomizer tube polishing machine..... C. L. Turner  
 Auger, Earth..... W. L. Iwan  
 Autocar brake..... A. Govan  
 Automobile driving mechanism..... E. Thomson  
 Automobile furnace draft device..... F. C. Cheesewright  
 Automobiles. Means for regulating the power of..... E. Thomson  
 Autotruck..... C. L. & R. A. Schultz  
 Awning..... C. H. Hansen  
 Bag holder..... D. W. Mitchell  
 Ball seam. Base..... B. T. Rogers  
 Ballot box..... J. McGaughey  
 Band tightener..... D. Mullaney  
 Bank, Savings..... A. C. Mills, Jr  
 Barn..... J. B. Stanhope  
 Barrel heading machine..... J. B. Stanhope  
 Bath brushes. Showering device for attachments to..... T. D. Vibiss  
 Bearing. Antifriction..... G. N. Toms  
 Bed bottom..... F. Vitpil et al  
 Bed rail lock or connection..... M. Benjamin  
 Bee nursery. Queen cell shield and queen..... A. Stanley  
 Beer. Converting wort into..... O. Selg et al  
 Bell ringer. Electric..... T. Lidberg  
 Belt, Body..... W. J. Teufel  
 Belt controller..... E. Michaud et al  
 Belt or chain tightener..... A. Anderson  
 Beverage dispenser..... G. A. Logan  
 Bicycle repair plug..... D. H. Cox, Jr  
 Blackboard attachment..... F. D. Jones  
 Blow torch. Vest pocket..... F. J. Walter  
 Boat, Submarine..... F. T. Cable  
 Boiler furnace..... E. F. Edgar  
 Bolt..... O. O. Bahle  
 Bolster roll..... J. B. Jones  
 Book. Duplicating sales..... N. S. Wright  
 Book or periodical..... I. Kitsee  
 Book, Orders out..... E. M. Davis  
 Book page marker..... R. R. Miller  
 Bookbinding machine..... G. Wallner  
 Boring holes for screw pins or dowels in wooden railway sleepers &c. Tool for..... F. Stahl  
 Boring machine. Variety..... M. L. Andrew  
 Bottle cap..... H. S. Brewington  
 Bottle holder and protector..... J. W. Graeme  
 Bottle manufacturing machine. Glass..... T. W. Simpson  
 Bottle, Non-refillable..... E. M. & T. H. Mars  
 Bottle, Non-refillable..... G. H. Spafford  
 Bottle or vessel stopper device..... G. P. Sullivan et al  
 Bottle stoppering machines, &c. Automatic feeder mechanism for..... F. O. Woodland  
 Bottles, &c. Packing..... A. Mauser  
 Bottles or similar vessels. Closure device for..... B. F. Miner  
 Box..... E. Gerbereux  
 Box..... H. P. Guyton  
 Box filling and closing machine. Paper..... R. P. Brown  
 Box forming machine..... C. W. Miles  
 Brake for electric or other tram cars or vehicles..... G. Atherton  
 Brake handle..... J. Grady  
 Brewing apparatus..... W. Griesser  
 Brick..... M. J. Murphy  
 Brick drying apparatus..... H. H. Walsh  
 Brick machine..... H. G. Smith  
 Brick work metallic bond..... H. E. Grant  
 Brick package..... W. Griesser  
 Brushes, Manufacture of..... J. F. Mumford  
 Bucket, Coal..... J. C. Burgess  
 Buckle..... J. E. Mitchell  
 Building block..... L. Cuatt et al  
 Building block lifter..... L. P. Normandin  
 Burner..... 2 pats..... G. Machlet Jr  
 Burglar alarm..... R. J. Fletcher  
 Cable hanger..... E. S. Marsh  
 Cable lubricator..... M. J. McGill  
 Camera attachment..... W. R. Smith  
 Can opener..... G. F. Hall  
 Can or vessel..... E. M. Jones  
 Cap or closure for receptacles. Safety..... F. B. Joy  
 Car body. Folding..... G. S. Grant  
 Car. Burglar proof express..... J. W. Vaughan  
 Car coupling..... 2 pats..... J. W. Smith  
 Car door..... S. J. Johnson  
 Car fender..... W. Johnston  
 Car protecting device..... C. Zimmerman  
 Car, Railway..... L. A. Shepard  
 Cars, &c. Burglar proof compartments for railway..... C. Zimmerman  
 Cars, railway carriages &c; Bogie or truck for tram or railways..... A. S. Nelson et al  
 Cars. Speed changing device for motor..... A. Angst  
 Carriage wheel joint support..... J. Scannell  
 Cash register, Pocket..... A. G. Huettel  
 Casing manufacturing machine..... A. Mauser  
 Cask. Reinforced cylindrical..... W. G. Avery  
 Cement testing machine..... J. W. Bramwell

Celluloid or pyroxylin compound and making same..... E. Zuhl  
 Centering. Collapsible..... B. H. Muehle  
 Chair..... A. Guerdwald  
 Checkrein hook..... J. H. Royer  
 Chimney flue thimble..... H. Anderson  
 Chlorate and perchlorate. Electrolytic manufacture of..... P. Lederlin  
 Cigar box..... M. Brown  
 Clasp..... C. H. Tomlinson  
 Clock..... E. Fitch  
 Clock, Electric..... U. L. Collins  
 Clothes line hook and elevator..... D. M. Chamberland  
 Clutch mechanism..... C. Jenatzy, Fils  
 Coal box..... C. Burwell  
 Coal handling machinery..... T. A. Coffin  
 Coal, &c. Means for cutting..... H. V. Neukirch  
 Coating iron with zinc. Electrolytically..... E. Goldberg  
 Coils. Forming..... J. W. Lundskog  
 Coils. Winding..... J. W. Lundskog  
 Coin detector chute..... O. Jaeger  
 Coke oven operating apparatus..... P. B. Hasbrouck  
 Collar pad. Horse..... J. R. Roach  
 Collar. Safety set..... C. Cloukey  
 Colter clamp..... J. Clayton  
 Combs, Manufacturing..... W. S. Bechtold  
 Combining machine..... H. Hoyle et al  
 Computer. Interest..... L. M. Landing  
 Concrete piles. Forming..... 2 pats..... F. Shuman  
 Connecting and strain equalizing device..... F. Hackmann  
 Copying press..... H. L. Davison et al  
 Core. Collapsible mold..... A. S. Cramer  
 Corn receiver..... N. Edwards  
 Corn shredders and huskers. Band cutters and feeders for..... N. G. Robinson  
 Corrugating tool..... J. Blumer  
 Cot and tent. Combined..... I. L. Gleason  
 Cot. Knockdown..... J. Linden et al  
 Cotton chopper..... F. F. Gerding  
 Cotton chopper..... H. F. Mackey  
 Cotton gin brush..... T. Brantley  
 Cotton huller, cleaner, and gin feeder..... E. B. Larson  
 Cotton in cotton boxes. Means for equalizing the distribution of..... M. A. Stephenson  
 Coupling rod jaws. Manufacture of..... P. Meyer  
 Cream regulating device for separators..... W. W. Price  
 Cream separator..... W. A. Odell et al  
 Cream separator. Centrifugal..... P. L. Kimball  
 Crushing mill. Three roll..... J. E. Bekker  
 Cultivator..... C. H. Grassing  
 Current motor..... C. W. Vliet  
 Curtain fixture..... A. Farland  
 Curtain pole bracket..... H. Bitner  
 Curtain shade and pole hanger. Combined..... M. D. Powers  
 Cushion for reciprocating beds or other moving parts..... T. M. North  
 Cutter head..... J. M. Kuebler  
 Dam..... R. C. Beardsley  
 Dental jig..... W. E. Griswold  
 Dental securing device..... W. E. Griswold  
 Dentists' tapers. Composition for..... L. C. Mandel  
 Deodorizing device..... R. C. De La Hunt  
 Derailment brake..... W. R. Carroll  
 Design and jacquards for same. Apparatus for making..... I. Kitsee  
 Die cutting machine work holder..... B. J. Abbott  
 Display card..... E. Zollner  
 Distilling apparatus. Water..... J. M. Coffman  
 Ditcher..... J. D. Brown  
 Ditching machine..... W. H. Johnston  
 Door closer and check..... M. Klingler  
 Door hanger..... G. W. Holly  
 Doors. Gang locking mechanism for cell..... A. J. Horgan  
 Dough dividing and compressing or molding apparatus..... J. Callow  
 Draft producing device..... C. Scott-Snell  
 Draft rigging..... W. Thornburgh  
 Drawer lock..... J. L. Dunning  
 Drawer lock..... A. Stoefler  
 Dress suit case..... J. R. Whitney  
 Drier feeding apparatus..... M. M. Graves  
 Dry battery..... E. M. Fishell et al  
 Drying machine. Fabric..... J. M. Levy  
 Dye and making same. Red azo..... K. Schirmacher  
 Electric arc light..... F. Buchanan  
 Electric brake..... W. B. Potter  
 Electric cable trough or conduit. Underground..... T. E. Devonshire  
 Electric carriers. Means for varying the speed of overhead..... H. M. Harding  
 Electric furnace..... P. L. T. Heroult  
 Electric lighting device..... H. C. Graybill  
 Electric machine. Dynamo..... C. P. Steinmetz  
 Electric motor controller..... F. A. Merrick et al  
 Electric switch..... C. F. Autenrieth  
 Electric switch..... J. D. Ihlder  
 Electric switch. Push button..... C. G. Perkins  
 Electrical apparatus for use of ultra violet rays..... F. F. Strong  
 Electrical apparatus switch..... E. R. Carichoff  
 Electrolytes. Preparing..... W. Gardiner  
 Electromagnet..... 2 pats..... I. G. Waterman  
 Elevator..... D. R. Macpherson  
 Elevator alarm signal..... E. L. & G. Hall  
 Elevator automatic stopping device..... J. Kobos  
 Embossing die..... E. D. Macfee, Jr  
 Empyema drainage device..... M. Chisholm  
 End gate fastener..... W. F. Davis et al  
 End gate fastening, Wagon..... H. A. Schermerhorn  
 Engines. Reversing gear for steam or other..... H. Lentz  
 Engraving machine..... J. T. Austin  
 Enslage machine..... E. W. Silver  
 Entrance closing apparatus..... J. Wendler  
 Exercising apparatus..... H. M. Hansen  
 Exhaust mechanism..... E. Karrer  
 Exhibiting reflected images. Apparatus for..... W. K. Dickson  
 Extracting apparatus..... E. Heimaun  
 Eyeglasses or spectacles..... A. Akeson  
 Faucet..... J. Brizard  
 Feed bag..... J. A. Gray  
 Feeders and band cutters. Regulating means for self..... C. C. Palmer  
 Fence post..... R. T. Van Valkenburg  
 Fence post..... P. Chapman  
 Fence weaving machine. Wire..... G. W. Whittington  
 Fiber cleaning machine..... M. Prieto  
 File, Paper or card..... E. W. Woodruff  
 Filter. Sand..... G. Engel

Finger ring..... C. Gosling  
 Fire escape..... W. H. Yeager et al  
 Fire escape..... C. N. Johnson  
 Fire extinguishing apparatus..... E. Zimmerman  
 Firearm ejector..... H. L. Powell  
 Fireproof window casing and sash..... C. Schroeder  
 Fishing and trapping device..... R. F. Armstrong  
 Flashlight apparatus..... L. Susanka  
 Floor polisher or oiler..... C. Weil  
 Flooring..... J. W. Heaton  
 Flow regulating device for solid materials..... G. Engel  
 Flushing apparatus..... H. F. Neumeyer  
 Folding box..... G. H. Savacool  
 Folding chair..... A. R. Milner  
 Food product and producing same..... A. A. Duham  
 Formed cutter..... C. W. Brock  
 Fruit gatherer..... E. E. Bennett et al  
 Fuel, Artificial..... M. F. Ward  
 Fumigating apparatus..... J. D. McReynolds  
 Funnel and device for supporting same..... L. H. Sternheimer  
 Furnace top. Blast..... G. K. Hamfeldt et al  
 Furniture. Leaf support for articles of..... O. R. Hunt  
 Galvanic battery..... E. L. Anderson  
 Game apparatus..... E. G. Mathewson  
 Garment fastener..... T. O. Hegg  
 Garment supporter..... J. Wilkinson  
 Garment supporter..... R. H. Waters  
 Gas burner..... C. W. Taylor  
 Gas burner..... B. Columbus  
 Gas burner and pilot light. Electrically controlled..... H. W. Webb  
 Gas check. Bunsen burner..... L. T. Weiss  
 Gas engine..... W. E. Nageborn  
 Gas furnace..... E. P. Reichhelm  
 Gas generator. Acetylene..... J. H. Mount  
 Gas producer..... A. Leclerc  
 Gas purifier..... E. F. Lloyd  
 Gas purifier. Centrifugal..... H. A. Humphrey  
 Gas receiver. Escape..... J. E. Claytor  
 Gas valve. Time..... H. McDuffie, Jr  
 Gate..... W. S. Harmon  
 Gearing..... W. O. Dayton et al  
 Gearing. Power transmission..... C. G. Nye et al  
 Gearing. Reversing..... A. Hrcjar  
 Glass blower's tube..... J. D. Blakeley  
 Gold from ores. Apparatus for extracting..... H. R. Cassel  
 Gold from ores. Extracting..... H. R. Cassel  
 Golf ball..... E. Kempshall  
 Grain drier..... H. T. Goss  
 Grain steepers. Combined clearer and lifter for..... V. Lapp  
 Gramophones in and out of operation. Device for throwing..... T. Birnbaum  
 Grate. Rocking..... E. F. Edgar  
 Grinding machine..... O. S. Walker  
 Ground. Forming openings in the..... F. Shuman  
 Gun carriage. Field..... A. T. Dawson et al  
 Hair drying comb..... R. D. O. Johnson et al  
 Harvester..... E. A. Maingnet  
 Harvester. Corn..... N. Bader  
 Harvester reel support..... J. F. Appleby  
 Harvester wing. Corn..... H. M. Burdick  
 Hay fork..... W. Louden  
 Hay rakes. Automatic pawl trip for horse..... E. A. Johnston  
 Headlight reflector..... F. Buchanan  
 Heating and ventilating apparatus. Combined..... G. Beddow  
 Heating apparatus..... A. Kehm  
 Heating apparatus..... T. J. March  
 Heating furnace..... J. A. Herrick  
 Heating furnace. Continuous..... R. B. Kernohan  
 Heel cushion and ventilator. Shoe..... J. H. Denton  
 Heel scouring machine..... W. B. Arnold  
 Heeling jack. Shoe..... J. H. Mullen, Jr  
 Hinge. Spring..... K. V. Clark  
 Hook and buckle. Combined..... B. S. Kearney  
 Horseshoe blank bending machine..... C. Arbutnot  
 Hub. Spring..... H. A. Krezdorn  
 Hydrate of calcium peroxid. Manufacturing..... G. F. Jaubert  
 Illusion device..... A. A. Welsh  
 Incandescent light holder..... R. E. Hess  
 Incubator..... J. W. Porter  
 Induction motor. Alternating current..... C. S. Bradley  
 Induction motor. Variable speed..... C. P. Steinmetz  
 Inhaler..... 2 pats..... S. O. Goldan  
 Injector. Steam..... J. Desmond  
 Inkstand..... J. M. Keep  
 Insect collecting machine..... C. L. Ferriotti  
 Internal combustion engine..... H. F. Wallmann  
 Ironing board. Folding..... H. Majors  
 Jar opening or closing tool..... J. H. Stull  
 Jewelry stand or easel..... W. B. Christopher  
 Journal box packing holder. Railway..... E. J. Trudeau  
 Keyboard attachment therefor..... G. L. Noe  
 Knob. Sheet metal..... W. A. Turner  
 Label. Metallic..... A. Chandler  
 Labeling machine. 2 pats..... J. G. Hendrickson  
 Ladder..... W. W. Pope  
 Ladle truck..... M. McDowell  
 Lamp burner..... C. H. Compton  
 Lamp, Electric arc..... R. Broderick et al  
 Lamp, Gas..... R. M. Dixon  
 Lamp globe holder. Arc..... G. E. Stevens  
 Lamp. Hand signal..... J. Hopson et al  
 Lamp. Incandescent gas..... C. A. Haas  
 Lamp. Oil..... A. V. Campbell  
 Lamp or burner. Argand..... H. C. Dunemann  
 Lantern. Signal..... M. Mercer et al  
 Latch. Gate..... J. J. Hynding  
 Lifting or screw jack..... J. M. Marzolf  
 Liquids. Apparatus for pouring out..... W. Schmitt  
 Liquids from solids. Apparatus for separating salt..... H. Duncan et al  
 Lithophone and Glauber. Making..... W. D. Gilman  
 Load transporting apparatus..... R. A. Needham  
 Lock..... N. W. Crandall  
 Lock and latch..... C. J. Caley  
 Lock and latch..... E. H. Dimock  
 Locking mechanism. Coin controlled..... G. P. Moore  
 Locomotive..... S. N. Mighell  
 Locomotive heater. Compressed air..... W. R. Pratt  
 Log or lumber hauling attachment..... S. H. Chase  
 Loom..... E. Powell  
 Loom harness mechanism..... E. S. Stimpson  
 Loom needle motions. Stop mechanism for..... G. F. Hutchins  
 Loom shedding mechanism..... G. B. Ambler  
 Loom warp stop motion..... J. Northrop



Loom warp stop motion..... H. A. Owen  
Loom warp stop motion..... A. K. Pratt  
Lubricator..... G. Fisher et al  
Lumber surface meter..... J. D. Bates  
Lumber trimmer, Automatic..... C. W. Willett et al  
Magnet, Solenoid..... G. T. Hanchett  
Mail bag..... W. & W. M. Rohde  
Mail bags, &c. Buckle for sealing..... J. Anschau  
Mail box..... J. W. Snedeker  
Mail catcher and deliverer..... J. W. Gilbert  
Maps, &c. Device for carrying and supporting..... P. R. Bullard  
Marble making tool..... E. P. Converse et al  
Massage machine..... A. D. Jones  
Massaging apparatus..... G. Sartori  
Mattress stuffing machine..... A. R. Kezer  
Measuring device, Liquid..... C. Simon  
Mechanical movement..... E. D. Gleason  
Mechanical movement..... G. H. Burpee  
Mechanical movement..... D. Felgar  
Mechanical movement casing..... A. Wahle  
Metal bars into sheets. Reducing hot..... T. V. Allis  
Metal polishing machine..... F. A. Weisbecker  
Metal tubes or pipes. Die for manufacture of..... J. Reimann  
Metallic box..... J. Nutry  
Metallic tie and rail fastener..... C. A. Willis  
Mine curtain..... A. O. Slentz  
Mirror support..... J. M. Conroy  
Mold..... J. Schinharl  
Mold..... E. M. Campen  
Molding apparatus appliance..... L. Berg  
Mop and scrub brush. Combined..... A. S. Held  
Mop wringer..... M. A. Elliott  
Motive power agency support..... H. Lemp  
Motor..... A. J. Burton  
Motor..... U. S. King  
Motor control system..... W. O. Mundy  
Motor, meter, or pump..... W. Ballerstedt  
Motors. Changing the frequency of single phase induction..... P. E. Chapman  
Muller..... A. G. New  
Music sheets. Device for trimming perforated..... L. B. Doman  
Musical instrument..... J. A. Bartholomew  
Musical notation..... L. H. Beswick  
Nail cleaner. Infant's..... G. J. Barnes  
Napkin holder. Sanitary..... F. M. Baldwin  
Nicotin catcher..... H. Feix  
Nigger bar..... J. H. E. Auger  
Nozzle. Spraying..... D. J. Seaman  
Nozzle. Steam..... W. S. Clarkson  
Nut lock..... L. Savaria  
Nut lock..... J. Edwards  
Nut lock..... P. E. Miller et al  
Oil. Refining..... C. B. Graham  
Optical projection apparatus..... J. Szczepanik  
Packing. Metallic waste..... A. L. Cole  
Paint and producing same. Water..... S. S. & B. Ruston  
Paint. Water..... S. S. & B. Ruston  
Paper cutter..... J. L. Lee  
Paper machine vats. Valve for..... J. E. Foy  
Paper serving fixture. Toilet..... A. H. Scott  
Paper. Toilet..... A. H. Scott  
Paste and cutting same. Apparatus for winding flat strips of..... A. Currie  
Pea pods from vines. Machine for picking..... G. W. Kelley  
Pedal attachment..... L. O. Peterman  
Pencil holder and guard..... S. J. Dohrmann  
Perforating machine..... F. P. Rosback  
Pessary..... E. M. Hewish  
Pessary..... W. W. Mitchell  
Phosphorus. Making..... R. K. Duncan  
Phosphorus making apparatus..... R. K. Duncan  
Photographic plate developing apparatus..... G. A. Hagner  
Photographic plate washer..... W. G. Mette  
Photographic printing apparatus..... H. H. McIntire  
Pick. Miner's..... A. Walker  
Pigment production. Manufacture of material for use in..... L. Wirtz  
Pile for forming concrete piling. Removable..... F. Shuman  
Piles. Making concrete..... F. Shuman  
Pipe connection..... F. G. Tallerdar  
Pipe joint. Flexible..... J. C. Martin, Jr  
Pipe wrench..... F. D. Bullard  
Planter..... T. M. Griffin  
Planter. Seed or potato..... C. H. Gerling  
Pliers..... H. C. Condit  
Plow cover or protector..... A. Luenberger  
Pocket. Garment safety..... J. A. Barling  
Polishing cone and wheel..... L. G. Koenig  
Power transmission..... J. L. Follett  
Precious stone setting. 2 pats..... J. C. Nordt  
Printing machine cylinder..... 2 pats O. Roesen  
Printing machine feed guard..... W. Spackhaver  
Printing press..... J. Krehbiel  
Printing press ink distributing mechanism..... G. H. Pierce  
Printing press inking apparatus..... M. Gally  
Printing press platen..... J. Thomson  
Propulsion apparatus. Vessel..... C. M. Coen  
Pump. Rotary..... C. W. Loomis  
Pump spring attachment..... J. O. Bane  
Pump. Steam..... F. D. Clinger  
Pumping system..... J. Bryan  
Punch..... T. E. Gray  
Punch. Hand..... R. Hayden  
Puzzle..... E. S. Mowry  
Radiator section connection..... C. F. Gessert  
Rail joint..... H. T. Campbell  
Railway brake..... P. Hallot  
Railway brake..... S. Cheney  
Railway rail joint plates. Manufacturing..... S. B. Sheldon  
Ram. Portable pneumatic..... J. B. Barnes  
Range finding device..... F. E. Molkow  
Refrigerator..... R. R. Graf  
Refrigerator. Counter..... J. Jensen et al  
Regenerative apparatus..... J. H. Henderson et al  
Rein supporter..... D. B. Wesson  
Retort walls, &c. Composition of matter used for protecting..... T. J. Carlton  
Ribbon feed regulating device..... H. N. Marvin et al  
Ring roll..... D. P. O'Brien  
Robe holder..... A. A. Jones  
Rocker joint..... O. C. Moore  
Roller..... B. E. Storr  
Roof..... L. P. Normandin  
Rotary engine..... J. S. Moseley  
Rotary engine..... J. Knowles  
Rotary engine..... A. I. Ostrander  
Rubber roll..... J. B. Forsyth

Rule. Slide..... W. H. Glaser  
Safes. Electrical signal for adding security to..... W. E. Arnold  
Safety pin. Double..... J. M. Howley  
Sander drum..... B. Storm  
Sash hanger. Storm..... O. F. Abrahamson  
Sash lifter..... G. Cassidy  
Saw. Drag..... L. Philipps  
Saw guide. Band..... W. H. Trout et al  
Sawing apparatus. Wood..... J. Rosenbaum  
Sawing machine..... C. D. Marsh  
Scale..... J. Lines  
Scale beam..... C. G. Strubler  
Schedule and train calculating machine..... J. M. Wilson, Jr  
Screen..... E. Hipolito  
Seal press..... J. W. Holley  
Sealing machine. Envelop..... J. P. Squires  
Secondary battery..... W. Gardiner  
Seeder..... E. F. Molck  
Seed hulls. Apparatus for separating kernels from..... F. P. Pope  
Sewer pit and trap. Combined..... J. M. Peters  
Sewing machine. Buttonhole..... R. L. Plumley  
Sewing machine cloth presser. Adjustable..... E. De Ville  
Sewing machine. Overseam..... R. L. Plumley  
Sewing machine. Overseaming..... P. Diehl  
Sewing machine thread waxing device..... Z. T. French et al  
Shaft. Composite..... O. F. Leibert et al  
Shafts and bars of any section. Means for coupling together endwise..... C. A. Chenn  
Shafting keys and key seats..... C. Hammen  
Shafting. Flexible..... W. D. Forsyth  
Shaving mug..... S. H. Leavenworth  
Sheet metal pipe former and groover..... M. L. Hunker  
Shelf bracket. Adjustable..... M. A. Heimann  
Shoe fastening..... G. Bryant  
Shoe for cloven footed animals..... B. Brand  
Shoe horn and shoe remover. Combined..... A. Hepner  
Shoe tie fastener..... W. E. Delano  
Sifter..... C. B. Comegys  
Sifting machine. Dustless ash..... A. Daniels  
Silk filaments. Apparatus for producing artificial..... E. H. Ryon et al  
Skinning knife..... G. N. Abbey  
Sleeve holder..... C. D. Jackson  
Sleeve link..... F. W. Phillips  
Smokeless and coal saving furnace..... R. L. Walker  
Snow or road roller..... C. W. Carter  
Soldering machine attachment. Can..... F. N. Prince  
Soldering machine. Can..... J. A. Steward  
Spark plug..... J. C. Anderson  
Speech receivers and transmitters. Guard for..... S. J. Ballard  
Speed and reversing mechanism. Variable..... R. B. Hain  
Speed indicating device..... T. D. & J. D. Millea et al  
Spinning machine..... Ding Cie Sui  
Spring motor..... J. R. Oliver  
Square clamp. T..... A. Sang  
Square, level, and tape measure. Combined..... R. E. Van Court  
Stamp affixing machine..... W. E. Newton  
Stand and easel. Combined..... E. Werner  
Stave press..... A. Hoffmann  
Steam boiler..... E. F. Edgar  
Steam generator..... A. B. Neiman  
Steam superheater..... F. E. & F. O. Stanley  
Stereotype plates. Machine for casting and trimming..... C. E. Hopkins  
Stoker. Mechanical..... E. F. Edgar  
Stone sawing machine..... J. P. Winter  
Storage apparatus..... J. M. Dodge  
Store goods lifter..... J. S. Nicholson  
Stove. Gas..... W. B. Cassidy  
Stove. Hot blast..... A. C. Kloman  
Stove. Oil..... W. H. Wilder  
Stove or range..... D. D. Berry  
Straining food products or the like. Machine for..... M. Schlusel  
Striking bag..... J. Gamble  
Stump extractor and grubber..... W. S. Chilton  
Superheater..... E. F. Edgar  
Swimming glove..... E. G. Vans Agnew  
Tachometer..... 2 pats..... C. H. Veeder  
Tackle block..... T. E. Maddux  
Tap for barrels. Measuring and registering..... C. Eichellspiker  
Telephone..... B. O. Fox  
Telephone..... E. H. Strauss  
Telephone circuit. Substation..... A. B. Stetson  
Telephone lock..... W. H. Scott  
Telephone receiver..... J. S. Goldberg  
Telephone ringing device..... J. I. Gemmill  
Telephone switchboard..... C. E. Egan  
Telephone system. Automatic central station..... F. Merk  
Temperature regulating appliance..... N. E. Nash  
Temperature regulator..... N. E. Nash  
Temperature regulator. Thermostatic..... W. S. Johnson  
Thermostat..... J. D. Gould  
Thermometer apparatus..... M. S. Bell  
Thill coupling..... G. W. Smith  
Thread cutter..... D. Flag  
Thread guide collar..... W. E. Sullivan  
Threshing machine..... A. A. Lowry  
Tile. Machine for removing glaze from the edges of..... M. A. Metzner  
Tiles. Ceiling..... W. Bremer  
Tire. Pneumatic..... R. A. Harris  
Tire. Vehicle..... J. A. Collet  
Tobacco hanger..... J. B. Cuzner  
Tool. Combination..... S. Chambers  
Tool holder..... C. F. Bellows  
Tooth pivot pin..... E. A. Clark  
Torpedo placing machine. Danger signal..... H. Simcoe  
Toy..... I. D. Worcester  
Toy..... E. Bull  
Toy lantern..... C. H. Wolfert  
Tray carrier..... C. L. Poillon  
Trolley..... A. S. Deem  
Trolley pole..... E. Schlicker  
Truck..... E. J. Bryan  
Truss. Herulal..... T. Beckwith  
Tubes of soft metal. Machine for forming..... W. S. Clark  
Tubing employed in metal beds. Closure for the ends of..... C. P. Walter  
Turbine. Elastic fluid..... L. Wilson  
Turbine. Steam..... D. F. Asbury  
Type writer..... C. F. Hopkins  
Type writer..... R. D. Stackpole

Type writing machine..... M. S. Eylar  
Type writing machine..... L. C. Neff  
Umbrella gear..... R. Reininger  
Umbrella gear..... J. Rose  
Vacuum tube. Adjustable..... M. H. Branin  
Valve. Air brake system controlling..... W. F. Knell  
Valve and means for actuating same..... E. Morterud  
Valve attachment for oil cans. Automatic..... E. A. Young  
Valve. Electropneumatic..... F. L. Dodgson  
Valve gear. Explosive engine..... A. Krebs  
Valve gear. Extension..... E. P. Coleman  
Valve operating mechanism. Automatic..... T. Denoyer  
Valve. Relief..... H. Lempy  
Valve ring. Piston..... A. Dobson  
Valve. Throttle..... J. S. Chambers  
Valves of explosive engines. Regulator for suction..... A. Clement  
Vapor burner..... G. F. Nolte  
Vat..... W. Griesser  
Vehicle apron..... J. B. Cretors  
Vehicle brake..... J. W. Rowe  
Vehicle. Motor road..... H. Cauzard  
Vehicle. Self propelled..... H. Lemp  
Vehicle transmission device. Motor..... C. Jenatzy, Flis  
Vending apparatus..... E. G. Matthews  
Vending machine..... E. S. Scheble  
Vessel edges. Machine for attaching metallic strips to..... W. G. Haas  
Vessel. Food containing..... W. J. Ablett  
Veterinary forceps..... G. Anderson  
Vise..... 2 pats..... J. R. Long  
Vise..... J. Hubner  
Vise. Pipe..... 3 pats..... J. R. Long  
Wagon body. Knockdown..... F. G. Tallerdar  
Wagon. Coaster..... F. V. Eavenson  
Wagon. Milk..... G. W. Evans  
Walnut hulling and washing machine..... G. F. Maier  
Washboiler..... A. Shaw  
Washing machine..... P. N. Andresen  
Washing machine..... E. L. Bullock  
Washing machine..... C. Garver  
Washing machine..... F. E. Hoover  
Washing machine..... A. A. Johnston  
Water closet..... W. E. O'Hara  
Water heater..... M. I. Cohen  
Water heater..... J. P. Ihart  
Wear compensating device..... L. Parish  
Weather strip..... J. N. McGriff  
Weather strip..... S. S. Stites  
Weather strip for windows, doors, or other structures..... P. L. Hedberg  
Weighing machine. Automatic..... F. N. Magee  
Weighing machine. Automatic..... A. A. Meyer  
Weighing machine. Automatic..... W. D. Tyler  
Well drill. Oil..... H. R. Decker  
Wells. Combined cable and rotary rig for drilling deep..... L. C. Sands, Jr  
Welt knife..... H. Karpenstein  
Whip..... L. H. Beals  
Whip. Drover's..... C. R. Lockwood  
Wick raiser..... C. E. Wirth  
Wick raiser. Adjustable..... C. E. Wirth  
Wick raiser. Adjustable..... W. W. Bradley  
Winding form..... J. W. Lundskog  
Windmill..... J. Coates  
Windmill regulator..... J. M. Lowe  
Window screen..... J. O. Adams  
Window screen..... H. D. Mills  
Window ventilator..... L. Zborowski  
Wire drawing machine..... D. J. McMahon  
Wire pay out reel..... J. P. Delphely  
Wire screening for cutting off pieces. Cabinet for storing, supporting, and unrolling..... L. K. Wynn  
Wire stretcher and wire splicing tongs..... C. Stoolfire  
Wood cutting machine. Fern or other..... A. A. Bartlett  
Wrapping material..... C. N. Payer  
Wrench..... L. Kules  
Wrench..... D. H. Irland  
Writing board. Hand..... C. J. Bellamy  
Zinc from copper slag. Obtaining sulfid of..... F. Brunjes

## DESIGNS.

Ash receiver..... H. R. Towne  
Badge..... O. Berninghaus  
Badge..... 2 pats..... H. E. Promnitz  
Badge..... C. C. Penfold  
Brooch or buckle plate or similar article..... P. O. Dickinson  
Grave marker..... A. J. Schafer  
Mirrors or similar articles. Back for E. Goetze  
Spoons, forks, or similar articles. Handle for..... C. A. Bennett  
Stove ranges. Connected bracket and high shelf for..... W. A. Spicer

Issued July 14, 1903.

## MECHANICAL PATENTS.

Adhesive applying mechanism..... J. C. F. Balze  
advertising device..... W. A. Demmon  
Air brake safety angle cock..... P. McGuire et al  
Ammonia from ammonia containing gases. Obtaining..... H. H. Dow  
Annunciator..... F. W. Dunbar  
Annunciator. Electrical..... J. H. Taylor  
Apparel. Article of..... J. Steinborg  
Armature coils. Form for winding..... W. F. Drees  
Automatic lubricator..... A. A. Freeman  
Automatic switch..... H. H. Doll  
Bag holder..... B. H. Willis  
Baling press..... T. A. Killman  
Barge. Freight..... L. P. Harvey  
Bath apparatus. Shower..... L. P. Dunn  
Battery connection..... L. Chronik  
Battery element..... L. Chronik  
Bed bottom..... W. D. Hunt  
Bed bottom..... C. Vallone  
Belt. Metallic money..... W. E. Holladay  
Belting..... C. Heron  
Bevel joint. Compound..... S. W. Moore  
Bicycle..... P. W. Tillinghast  
Bicycle carrying attachment..... L. Murdoch  
Binder. Loose leaf..... W. Saunders  
Bird chaser..... H. F. Weber  
Blackening device. Shoe..... W. G. Callender  
Bolster..... A. A. Sack  
Bobbin..... C. B. Albrece

Bolt locking device..... J. F. Clegg  
Bolting cloth. Brush device for cleaning..... C. W. Mann  
Book. Manifold account and sales..... G. A. Holm  
Boot finishing machine wheel..... G. H. Catt  
Bottle funnel neck. Water..... R. D. Bradley  
Bottle tin foiling machine..... C. R. Twitchell et al  
Bottle washing machine bottle holder..... B. F. Schirmer  
Brake beam..... L. A. Shepard  
Brake beam..... B. T. Handiges  
Brake beam..... A. Lipschutz  
Brake system. Electric..... F. E. Case  
Braking moving loads..... F. E. Case  
Bread mixer and kneader..... J. F. Stevens  
Bridle bit..... W. T. Temple  
Bromids from bromin containing solutions. Manufacturing..... H. H. Dow  
Bromin. Manufacturing..... H. H. Dow  
Brooder..... I. Morrow  
Buggy. Baby..... S. C. Wolfskill  
Building block and wall..... J. A. Ferguson  
Building. Metallic..... J. Spelman  
Bulkhead or other doors. Mechanism for operating..... G. C. Ralston  
Bunk or mattress frame..... J. P. Lein  
Bunsen burner..... A. B. Redell  
Button or fastener..... W. Walter et al  
Cane, &c. Electrical rotary portable machine for cutting sugar..... S. J. Hylton-Bravo  
Car brake rods. Brake jaw for..... A. Lipschutz  
Car coupling..... P. Brown  
Car. Dump..... H. W. Wolff et al  
Car. Push..... M. C. Hamilton  
Carbon brush holders. Clamp for use in connection with socket..... O. M. Stiegler  
Carbureter..... L. F. Washburne  
Carbureter..... G. H. Maurer  
Carbureter for motor bicycles..... A. Clement  
Carbureter for petroleum motors. Pulverizing..... F. Charron et al  
Carding machine..... M. J. Gahagan  
Carding roll teeth. Tool for straightening..... N. G. Huffstickler  
Carpet stretcher..... T. J. Hall  
Carpet sweeper..... A. H. Dodd  
Carton closing machine flap folder..... C. Redd et al  
Carton ends. Block for machines for forming..... C. Redd  
Carton ends. Machine for closing and sealing up..... C. Redd  
Carton holder for machines for folding and gluing the end flaps of cartons..... G. H. Cormack  
Cartridge primer..... J. Gardner  
Casings. Machine for the manufacture of..... A. Maser  
Cash register..... A. Godefroid  
Cash register..... C. F. Crowder  
Ceiling anchor..... M. Murray  
Cellulose esters. Making..... G. W. Miles  
Centrifugal machine driving mechanism..... 2 pats..... G. Engel  
Chafe iron. Roller..... A. P. Smith, Jr  
Chair..... H. E. Knauss  
Chair..... C. C. Black  
Chair..... J. A. Manahan  
Check hook. Spring..... F. Clark  
Chimney cowl..... F. W. Stein  
Chuck..... G. C. Gammell  
Chuck. Centering..... J. Rusche  
Cigar making machine..... D. Cousine  
Cistern forming device. Adjustable..... N. Brown  
Clarifying apparatus..... T. W. Manning  
Cleats to barrels, &c. Machine or tool for applying holding..... A. T. Pope  
Clutch. Friction..... E. Liken  
Coal drill support..... A. Walker  
Coal or wood bag..... F. S. Converse  
Coat lining..... M. Weber  
Coke. Gage..... W. Guethler  
Coke oven..... G. S. Ramsey  
Coke. Removing silica from..... C. M. Hall  
Collar. Horse..... W. C. Lawson  
Collar retainer..... R. P. Schilling  
Composition of matter..... K. N. Lundblad  
Concrete or plastic material. Mold for making articles of..... J. A. McNamee  
Condenser for nitric or other acids..... W. Bate et al

Conveyer..... J. F. Cook  
Conveyer..... F. E. Blaisdell  
Corn cutting and crushing machine..... J. S. Bloom  
Cotter..... E. W. Merrill, Jr  
Cotton press..... J. J. Atkinson  
Counter and index..... J. M. Cory  
Coupling..... P. H. Mack  
Cover. Receptacle..... E. J. Gorman  
Cream separator and churn..... A. D. Frederick  
Cream whipping machine..... F. E. A. Brock  
Crossing alarm. Automatic..... J. P. Church  
Cultivator..... C. L. Swanson  
Cultivator and grader. Roller..... C. E. Dungan et al  
Cultivator attachment..... W. H. McElree  
Cultivator, cotton planter, and fertilizer distributor. Combined..... L. R. Randall  
Cultivator planting attachment..... J. W. Benton  
Curtain drying apparatus..... H. S. Hildebrand  
Curtain hanger..... L. E. Trax  
Cuspidor..... G. W. Shade et al  
Cut off for house plumbing..... C. G. Woods  
Cutter bar sections. Machine for testing..... G. G. Barker et al  
Cutting machine..... W. Ross  
Cutting tool..... C. T. Ridgely  
Damper. Pipe..... H. J. Noyes  
Damper. Stove or furnace pipe..... E. N. La Veine  
Damper time controller..... E. Zwicker  
Demagnetizer..... W. J. Forster  
Dental machine frictional gearing..... L. L. Bosworth  
Disinfecting apparatus..... M. Otto  
Display stand and truck. Combined..... J. A. Kelly  
Domestic boiler..... H. A. Miller  
Door. Automatically opening or closing sliding..... B. H. Loffler  
Door controlling means..... A. D. Caywood  
Door. Inside grain..... A. S. Swenson  
Draft rigging. Solid..... E. Lewis  
Dress suit cases. Traveler's reclining attachment for..... C. C. Taylor  
Drill attachment for drill presses. Multiple..... F. A. Kehl et al  
Drill cleaning device. Disk..... O. A. Poirier



Eccentric..... C. W. Lee  
Egg beater..... W. G. Browne  
Electric accumulator. Active material..... S. A. Rosenthal  
Electric conductor conduit and trough..... T. E. Devonshire  
Electric controller..... D. L. Lindquist  
Electric controller..... 5 pats..... A. Sundh  
Electric incandescent light wires. Fire arrester for..... O. H. R. Schulze  
Electric meter bearing..... G. H. Alton  
Electric motors. Electrohydraulic controller for..... A. Sundh  
Electric socket..... W. S. Stapley  
Electric switches, cut outs, &c. Means for protecting the exposed or live parts of..... W. McDevitt  
Electric time switch..... I. S. & E. F. Callender  
Electric vapor appliance..... M. Von Recklinghausen  
Electrolytic apparatus..... L. Gurwitsch  
Electromagnet..... D. L. Lindquist  
Elevator..... J. S. Muckle  
Elevator car signaling apparatus..... C. A. Reiners  
Elevator doors. Locking attachment for sidewalk..... P. H. Jackson  
Elevator gate operating mechanism..... C. L. Colby  
Elevator safety appliance. Electric..... G. L. & G. Hail  
Elevator safety clutch..... J. A. Bridges  
Elevators. Electric controller for hydraulic..... J. W. Moore  
Embossing molds. Preparing..... E. O. Loveland  
Enameling. Work holder for..... S. H. Frist  
Engine current breaker. Hydrocarbon..... G. R. Albaugh  
Engine speed regulator. Explosive..... H. A. Gilman  
Engines. Air and gas mixer for explosive..... T. Charlton  
Equalizer. Four-horse..... J. W. Gamble  
Excavator..... P. J. Raymond  
Exhibiting apparatus..... E. Barthelmy  
Eye shade..... T. Little  
Eyeglass frame. Bar spring..... H. Tremblay  
Eyeglasses..... F. K. Garland  
Faucet attachment..... C. A. Smith  
Feed water heater..... B. J. White  
Fence. Wire..... E. L. Froggatt  
Fence. Wire..... B. B. Wood  
Fertilizer distributor and seed drill..... W. L. Kennedy  
Fiber preparing machine..... M. Prieto  
File. Document..... W. O. Gottwals  
Filling can..... J. W. Jack  
Filter..... R. S. Brownlow  
Filter. Water..... W. G. Tousey  
Filtering press..... V. Lapp  
Fire extinguishers. Sprinkler head for automatic..... G. E. Hibbard  
Fire extinguishing apparatus..... J. W. Rapp  
Fire shield..... J. J. Plucker  
Firearm. Automatic..... J. T. S. Schouboe  
Fishing rod..... A. E. Hall et al  
Flash boiler..... A. A. Ball, Jr  
Flash lamp..... A. Duthe  
Flue cutter..... J. C. Groble  
Flue hole cutter..... J. G. Dixon  
Folding table..... J. A. Knight  
Fruit carrier..... G. W. Stevens  
Fruit picker..... J. S. Hamilton  
Furnace petroleum burner..... E. D. Dennison  
Gambrel..... L. Neathamer  
Game apparatus..... M. S. Bliss  
Game apparatus..... J. N. Arriaga  
Game apparatus..... C. Koch et al  
Game board..... H. L. Haskell  
Gang plank..... J. Riley  
Garment..... W. E. Warner  
Garment triple supporter and adjuster..... H. E. Grebner  
Gas and backwater trap and tide flushing gate. Sewer..... F. W. Rathbun  
Gas burner. Incandescent..... A. Farkas  
Gas check..... G. A. Brachhausen  
Gas generator. Acetylene..... J. S. Philpott  
Gas lighting attachment. Automatic..... C. F. Mason  
Gases. Means for controlling the flow of..... H. H. Dow  
Gaseous fuel burner..... O. Falkenwelder  
Gate..... H. Terry  
Gate for coal or other pockets..... J. Campbell  
Glassware. Machine for the manufacture of..... 2 pats..... C. E. Blue et al  
Gluing wheel..... C. Redd  
Governor for gasoline engines. Sparking device..... O. J. Root  
Governing mechanism. Valve..... W. W. Spinney  
Grain dump and elevator. Portable..... E. & H. V. Schroeder  
Grain elevator..... C. F. Dueringer  
Grain or fertilizer drill or distributor..... B. F. Robinson  
Greenhouse..... F. S. Ford  
Grinding and pulverizing mill..... T. Breakell  
Grinding file blanks, &c. Machine for..... J. Turner  
Grinding mill..... H. Scharbau  
Gun fluid pressure brake..... O. Behnke  
Hand strap..... 2 pats..... J. H. Myers  
Harness..... S. Way  
Harvester attachment for raising and saving down grain..... W. M. Wadleigh  
Harvester. Potato..... O. Kirkham  
Harvesting machine shocking device..... W. Doering  
Hat forming machine..... G. W. Chamberlain  
Hassock and sleeping support combined..... C. C. Taylor  
Heater..... H. M. Sturgis  
Heater and steam generator..... O. R. Rand, Jr  
Heating device..... W. H. Henderson  
Hoist block for cranes or derricks..... C. L. Taylor  
Hoisting apparatus..... F. Dunbrook et al  
Hoisting apparatus..... G. Blaauw  
Hoisting motor..... A. A. Ball, Jr  
Hollow mill..... W. B. Pearson  
Hoof pad..... W. J. Kent  
Hop separating machine screen..... J. Muller  
Hose supporter. Lady's and child's..... L. A. Yost  
Hot water furnace..... W. R. Thomas  
Hub and roll back..... C. J. Caley  
Hydrant..... C. L. Howes  
Hydrocarbon burner..... J. J. Fitton  
Implement handle..... J. Schwartz

Illuminating device and reflector for show cases..... W. A. Merritt  
Incandescent mantle supporting device..... F. A. Ward et al  
Index and indicator for account books. Combined..... W. C. Hunter  
Index. Land..... W. A. Ragland  
Inking appliance..... J. I. Litchfield  
Insulating mediums. Producing..... F. Basenau et al  
Internal combustion engine..... V. R. Nicholson  
Jar closure..... D. B. Shinnick  
Julep tubes. Machine for making S. K. Green  
Key operated machine casing..... D. E. Felt  
Kindling block..... E. Pollard  
Knitting machine needle bars. Machine for making straight..... W. D. Richter  
Lacing for shoes, &c..... W. F. Hall  
Lamp and battery. Combined portable electric..... M. Sutherland et al  
Lamp attachment. Arc..... S. Lawrence et al  
Lamp globe holder. Arc..... R. H. Read  
Lamps. Series resistance for gas or vapor electric..... S. E. Flichtner  
Lamps. Starting device for gas or vapor electric..... S. E. Flichtner  
Lantern. Signal..... P. Abraham  
Last. Shoe..... F. Kellner  
Lifting jack..... R. B. Murphy  
Limb. Artificial..... E. H. Erickson  
Line casting machine..... W. S. Scudder  
Linotype machine nipple..... J. B. Allen  
Liquid fuel burner..... J. B. Bladon  
Liquid separator. Centrifugal..... C. A. & O. W. Hult  
Litharge. Making..... J. W. Bailey  
Loading device. Automatic..... T. M. Park  
Lock shoe..... W. L. Denson  
Logging spool..... R. Barr  
Loom..... N. M. Shinn  
Loom for making laces..... A. Ronsdorf  
Loom harness..... C. Knibbs et al  
Loom. Lappet..... H. Ledoux  
Loom needle motion..... G. F. Hutchins  
Loom picker stick mechanism..... W. H. Kelley  
Loom shuttle cop carrier or spindle..... M. Goodwin, Jr  
Loom shuttle. Weft detecting..... R. Slack  
Loom weft replenishing mechanism..... E. A. Thissell  
Lumber seasoning apparatus..... B. B. Gray  
Mail bag closure..... C. A. McKinney  
Mail box..... F. F. Hunter  
Mail box..... W. G. Dougall  
Mail delivery bag..... J. F. Stroh  
Mangle..... K. Henrikson  
Manufacturing device..... H. H. Norrington  
Massaging implement..... C. S. Whitney  
Massaging instrument..... B. E. Joseph  
Measuring and filling machine..... T. Smith  
Measuring apparatus. Illumination D. Burnett  
Measuring gage..... R. C. Wright  
Mechanical movement..... M. Holman  
Medicated plaster..... F. J. Nash  
Metal anode..... H. E. Starrett  
Metal sheets. Machine for piling..... B. Goldsmith et al  
Metal sulfates from mattes. Obtaining..... O. Meurer  
Metallic post..... J. W. Altmyer  
Metallic wheel..... J. H. Haskins  
Metallurgical processes. Apparatus for use in..... J. H. & R. H. Officer et al  
Milk pasteurizing apparatus..... L. Sturges  
Miner's crate..... G. R. MacDonald  
Mining cage safety chair..... H. Hanson et al  
Miter box..... R. H. Dorn  
Moistening and sailing apparatus. Envelop..... W. Henderson, Jr  
Mop..... C. Morgan  
Mop head..... H. Bitner  
Mop head..... C. Morgan  
Motor controller. Alternating current..... A. Kimble  
Motor controlling device. Alternating current..... D. L. Linquist  
Musical instrument. Electrically operated..... G. H. Davis  
Musical instrument playing mechanism..... F. R. Wyckoff  
Musical instrument. Self playing W. M. Stine  
Musical instruments. Spool for use with automatically playing..... A. W. Nunn  
Nebulizer..... R. L. Benson  
Necktie..... O. W. Peterson  
Nipple. Safety..... F. A. Colwell  
Nozzle and tap. Combined..... W. J. Dalton  
Nut. Axle..... 2 pats..... S. R. Bailey  
Nut lock..... O. P. Broyles  
Nut lock..... P. C. Secor  
Nut lock..... J. G. Brandon  
Nut lock..... G. B. M. Pike  
Obstetrical forceps..... H. E. Koch  
Oiling device. Axle..... T. S. Philpott  
Ore, &c. Apparatus for handling..... F. K. Hoover et al  
Organ and pneumatic action therefor. Self playing..... J. E. Prante  
Oven deflector..... M. Flannery  
Ozonizers. Arrangement for the support and cooling of static..... J. M. Otto  
Packing. Piston rod and valve stem..... J. Janda  
Packing ring. Piston..... H. Lemp  
Padlock. Permutation..... T. A. Dinsmore  
Pail ear..... J. Easker  
Paper box end closing machine..... C. Redd  
Paper holder..... O. Harriman  
Paper making machine..... O. M. Farwell  
Pasting up the ends of cartons, &c. Machine for..... R. F. W. Beardsley  
Pen inking device Draftsman's H. W. H. Powel  
Pen. Self filling fountain..... C. A. Faber  
Phonograph sound records. Apparatus for duplicating..... C. Walcutt  
Photographic cartridge film. Flexible..... P. B. Cady  
Piano action adjustment..... H. Mallebre  
Piano music desk..... H. Mallebre  
Picture exhibitor..... U. L. Berger  
Picture frame adjustable regulator..... F. C. Brown et al  
Picture frame or easel..... G. Mendel  
Pigments. Making..... W. J. Armbruster  
Piling. Sheet..... L. P. Friedstedt  
Pipe coupling..... O. A. Thaus  
Pipe molding apparatus..... T. D. Young  
Pipe or conduit coupling..... W. W. Benson  
Pipe or rod coupling device..... A. Sundh  
Pipe wrench..... N. Boulanger  
Pipe wrench..... J. B. Tupper  
Pipes, conduits, &c. Coupling for W. W. Benson

Plaiting machine..... D. L. Chandler  
Planter. Seed..... W. H. Ledbetter  
Plow..... A. G. Steele  
Plowshare holder..... O. B. Graves  
Pocket. Safety..... T. C. Loudon  
Polarity indicator..... F. P. Cox  
Polish..... J. F. Myers  
Poultry trough..... B. F. Williams  
Powder. Glazing..... A. I. Du Pont  
Powder glazing apparatus..... A. I. Du Pont  
Power transmitting device..... J. Schneible  
Precious metals from their ores. Extracting..... J. W. Maxwell et al  
Pressure regulated switch..... A. Sundh  
Pressure roller..... F. I. Dana  
Printers' furniture. Mold for casting I. Baas  
Printers' metal furniture. Making..... I. Baas  
Printing frame automatic register..... O. H. Eichler  
Printing machine. Flat bed oscillating cylinder..... T. Cossar  
Projectile..... R. W. Scott  
Propeller..... H. H. Abell  
Propelling and steering vessels. Mechanism for..... S. H. Taylor  
Pulley..... E. Schumacher  
Pulley. Catch..... F. Wuest  
Pump rod adjuster. Oil well..... A. C. Price  
Punch..... C. S. Dundore  
Punch press safety device..... J. Miotke  
Puzzle..... A. H. Wallace  
Rafting dog..... T. H. Curtis  
Rail fastening..... G. A. Weber  
Rail joint..... R. L. Conner  
Rail joint..... E. J. Gaynon  
Rail. Sectional..... M. F. Bell  
Rail tie..... J. Kelly  
Railway brake..... P. Hallot  
Railway crossing gate..... N. Perrault  
Railway pivot blade joint..... W. Watts  
Railway tie..... B. B. Moss  
Railway tie..... O. Hughes  
Railway tie..... C. C. Shatto  
Railways. Nozzle appliance for cleaning..... F. A. Jones  
Razor. Safety. 2 pats..... F. R. & O. Kampfe  
Rheostat..... W. C. Yates  
Rimring machine..... G. A. Ensign  
Riveting machine..... G. E. Martin  
Roasting furnace..... F. Klepetko  
Rocker. Spring..... A. M. Wolf  
Rod..... C. F. Axelsson  
Rolling mills. Means for the control of the electrical driving of reversible..... C. Ighner  
Roofing compound..... G. E. Reynolds  
Rope grip and brake for ascending or descending ropes. Eccentric lever..... R. Cockerell  
Rotary cylinder engine..... J. G. Gracey  
Rotary engine..... R. R. & J. H. Vogan  
Rotary steam engine..... F. J. Waters  
Rubber dam holder..... E. B. Marshall  
Rustproof and fireproof composition..... G. & G. Bevilacqua  
Sad iron..... D. R. Blair et al  
Safe..... B. France  
Sand, &c. Distributer for..... J. J. Mulligan  
Sand molds. Forming..... J. B. Neesham  
Sash fastener..... J. E. Gibbs  
Sash light securer..... G. K. F. Franke  
Sashes. Automatic spring catch for sliding..... J. T. & C. M. Young  
Saw frame. Drag..... E. E. Redfield  
Saw handle. Hand..... M. E. Hunter  
Saw sharpening device..... G. A. W. & J. H. L. Folkers  
Sawmill friction feed..... S. Smith  
Screw thread cutting machine..... C. F. Wieland  
Seal. Car..... S. F. Estell  
Seal for pipe couplings and nuts..... W. Mooney et al  
Seaming machine. Sheet metal box..... H. J. Reinert  
Sectional boiler..... J. G. Wagstaff  
Serrefin..... C. D. Lukens  
Sewage or like tanks. Apparatus in connection with..... T. H. Ramsden  
Sewing machine feeding mechanism..... W. H. Stedman  
Sewing machine presser foot..... A. A. Merritt  
Sewing machine. Shoe..... J. Laurin  
Sewing machine trimming mechanism..... W. H. Stedman  
Shackle..... F. J. Briggs  
Shipping case..... M. S. Downey  
Shoulder braces..... G. E. Bates  
Sign. Day or night..... H. M. Beugler  
Signaling. Magneto electric semaphore..... L. G. Woolley  
Skewer machine feed mechanism..... O. P. Beck  
Smelting metals and metal compounds G. Egly  
Snap hook..... V. D. Sibley  
Soldering of aluminium..... H. Lange  
Soldering machine. Side seam can E. J. Moore  
Speed indicating and distance measuring mechanism..... J. W. Darley, Jr  
Speed indicating mechanism..... J. W. Darley, Jr  
Spice feeding receptacle..... R. W. Cramer  
Spinning machine needle frame G. Van Meurs  
Spinning ring..... A. A. Lovejoy  
Spinning spindle..... W. Gihon  
Spring bottom..... W. D. Hunt  
Square and level. Combination right angle..... A. E. Victor  
Stanchion. Cattle..... E. & J. P. Reck  
Stand..... D. K. Wade et al  
Staple..... J. Rupert  
Steam boiler..... D. M. Webster  
Steam engine. Compound..... F. Caha  
Steam generator..... J. A. Miller  
Steering gear. Boat..... E. C. Akers  
Stereoscopic apparatus..... H. C. Snook  
Stirrer for cooking receptacles S. J. Ellis et al  
Stocking..... L. N. D. Williams  
Stoker for fire chambers of furnaces, &c. Underfeed mechanical..... E. W. Jones  
Stoker. Mechanical..... J. W. Kincaid  
Stoking mechanism..... F. A. Daley  
Stone mold. Artificial..... E. B. Jarvis  
Stopper attaching device..... A. H. Tatum  
Storage battery..... R. N. Chamberlain  
Stove and steam generator. Combined cooking..... D. Cline  
Stove. Gas..... D. J. Clark  
Stove. Gas..... H. Eldridge  
Stove. Heating..... S. F. Shafer  
Stovepipe clamp..... J. M. Whitney  
Strap folding device..... B. Cohen  
Surveyor's slate and book holder E. McConnell  
Switch binding post and contact. Electric..... W. C. Tregoning

Swing..... E. F. Miller  
Switch box. Protective electric..... A. Sandh  
Synchronizing alternator..... C. P. Steinmetz  
Table..... L. Weiker, Sr  
Table lock. Pedestal..... C. S. Burton  
Table locking device. Pedestal..... E. Tyden  
Tally board..... F. A. Glidden  
Tap hole closer..... J. Hlavacek  
Telegraph repeater..... F. W. Jones  
Telegraphy. Submarine..... A. Muirhead  
Telephone line contact apparatus..... J. P. Werner et al  
Telephone toll indicator..... G. A. Long  
Thermometer case. Clinical or other..... F. J. Berberich, Jr  
Thill coupling..... I. Osgood  
Ticket case..... R. A. Edgar et al  
Tile or other decorative device..... H. C. Mercer  
Tire. Pneumatic..... A. Vreeland  
Tire tightener..... R. M. Payne  
Tire. Vehicle..... J. W. Carter  
Tongs. Chain..... C. F. Hultgren  
Tool. Combination..... L. Bruni  
Tool post. Adjustable..... B. M. W. Hanson  
Top roll saddle and stirrup..... E. Dixon  
Toy. Mechanical..... G. W. Macko  
Toy. Sounding..... H. F. Weber  
Trap..... T. F. Foley  
Trolley circuit breaker..... C. P. Breese  
Trolley. Electric line..... K. Lyons  
Trolley head..... F. V. Marsh  
Trolley pole guide..... H. O. Woodbury  
Truss. Hernal..... J. B. Sheehan  
Tube or rod clamp and coupling..... B. Draper  
Tubes. Machine for forming tapered..... W. C. Sargent et al  
Turbine. Compound..... G. C. Davison  
Turbine engine..... S. Lount  
Turn table for transferring casks from one chute or rolling track to another E. Hoffmann  
Type writing machine ribbon guide and paper holder..... R. Koch  
Upsetting machine..... R. G. Beker  
Valve..... W. W. Spinney  
Valve. Brake..... F. E. Schmitt et al  
Valve for water heaters. Automatic..... G. A. Mentel et al  
Valve gear for motive fluid engines. Trip expansion..... G. Thornley  
Valve. Steam..... C. White  
Valve. Straightway..... E. M. Erdman  
Vegetation destroying apparatus. Floating..... J. D. Austin  
Vehicle body..... L. Priest  
Vehicle covering or awning..... S. W. Wortley  
Vender. Mechanical..... L. H. Jennings  
Vending machine..... S. A. Webber et al  
Vending machine. Automatic F. C. Hutchinson  
Vending machine coin-controlled device..... S. A. Webber et al  
Vessels. Determining the nautical bearing of navigable..... H. W. Ladd  
Voltaic cell..... C. T. Richmond et al  
Washer..... E. H. Krebs  
Washing machine..... M. Holman  
Water closet bowls or washbasins. Mechanism for temporarily locking..... E. Woodruff  
Water level indicator, recorder, and alarm. Electrical..... J. R. Flood et al  
Weather strip..... 2 pats..... J. B. A. La Jennesse  
Weighing machine. Automatic..... E. F. Delery  
Weighing scoop. Automatic..... W. Maxwell  
Well partition plug. Oil..... C. S. Little  
Whip..... J. W. Veit  
Wick. Lamp..... R. Guild  
Wick raiser..... W. H. Wilder  
Windmill..... E. H. Benedict  
Wind motor..... C. E. Field  
Window..... J. Neff, Sr  
Window fly-screen..... W. Thompson  
Window screen..... L. J. R. de Vries  
Wire grip..... J. C. Logue  
Wire stretcher..... J. E. Howell  
Wire. Winding flat..... R. Varley  
Wires. Means for preventing bending strains in..... J. J. Shickluna  
Wood carving machine..... A. W. H. Raettig  
Wood chipping machine feed box..... J. H. Baker  
Wrench..... M. E. Worden  
Wrench..... W. J. M. Hames

## DESIGNS.

Adding machine stand. Metal..... H. Poesche  
Badge..... E. O'Callahan  
Border for vessels, &c..... E. H. Goetze  
Bottle..... C. Hitzl  
Box. Candy..... 5 pats..... F. L. Daggett  
Broom holder. Whisk..... M. A. Skail  
Carpet..... L. H. Brown  
Coffee pot or similar article..... E. Piepenbring  
Crumb scrapers, &c. Handle for..... E. H. Goetze  
Display rack..... M. R. Botkin  
Finger ring or similar article..... C. H. Eldredge  
Foot for vessels, ornaments, &c. E. H. Goetze  
Glass. Plate..... A. D. Brogan et al  
Handle for vessels, &c..... E. H. Goetze  
Mirrors or similar articles. Back for..... T. F. Pryor, Jr  
Nail cleaners, &c. Handle for..... W. H. Saart  
Spoon or fork handle..... P. B. Ball  
Spoon or fork handle..... F. Habensack  
Spoons, forks, or similar articles. Handle for..... W. C. Codman  
Spoons or similar articles. Handle for..... J. E. Straker, Jr  
Stove..... T. R. Kennedy et al  
Stove burner drum. Oil..... W. H. Silver  
Stove. Oil or gas..... C. H. Boeck  
Stove or range..... J. Magee  
Stove top plate and rim. Oil..... W. H. Silver

Issued July 21, 1903.

## MECHANICAL PATENTS.

Acetyl cellulose..... A. Eichengrün et al  
Adding and recording machine..... A. S. Dennis  
Adjustable wrench..... E. F. Hirst  
Air compressor..... G. Code  
Alkali chlorides. Apparatus for the electrolytic decomposition of..... C. Fournier  
Animal trap..... T. J. Foreman  
Apparel clasp. Wearing..... W. Maybaum  
Automobile rear axle construction..... W. Morrison  
Automobile transmission gearing E. Whitcraft  
Automotor carriage..... C. J. Ollagney  
Awning operating device..... C. H. Talley  
Balls. Manufacture of golf..... C. T. Kingzett



Band cutter..... T. E. Creclius  
Barrel filler..... F. W. & G. N. Inden  
Barrel scrubbing machine..... H. Olsen  
Barrel washing tank..... H. Olsen  
Battery..... D. Drawbaugh  
Battery switch, Electric..... J. Appleton  
Bearing, Ball..... A. Riebe  
Bearing, Rocker side..... F. B. Townsend  
Bed, Folding..... A. W. Pyle  
Beer, Preserving..... F. Crotte  
Beers or other liquids requiring added and even pressure. Device for handling..... F. Swinney  
Bell switch, Rotary extension..... G. E. Cork  
Belt fastener..... M. N. Edwards  
Belt lacing tool..... T. Gingras  
Belt, Waist..... H. J. Gaisman  
Bending machine and die therefor..... G. F. Hutchins et al  
Bicycle gearing..... C. S. Thompson  
Bill holder..... J. H. Parks  
Binder, Loose leaf..... G. W. Sheridan et al  
Blacking stand shoe holder, Boot..... E. L. Hann  
Boilers, Prevention and removal of incrustation in steam..... R. L. Gamlen  
Bolster..... T. Mitchell  
Bolt heading machine..... C. W. Richards  
Book support..... C. P. Bley  
Boots or shoes, Mechanical hammering device for use in the manufacture of..... G. Kron  
Boring machine..... A. Falkenau  
Bottle closure..... W. Harrison  
Bottle, Non-refillable..... L. Brand  
Bottle or jar safety-closure..... J. V. Hull  
Bottle stopper..... A. T. Otto  
Bottle washing machine..... J. G. Hauck  
Box lock, Collapsible..... J. R. Van Wormer  
Box locking attachment..... F. H. Chase  
Bracket for supporting rods or tubes..... A. I. Grainger  
Brake mechanism..... W. H. Wendler  
Breach mechanism..... J. B. Moore  
Brick-cut-off table..... W. Frey  
Bricks or bodies for refractory linings, &c. Making..... E. W. Engels  
Bricks or bodies for refractory linings, &c., and the product thereof. Making..... E. W. Engels  
Bridle..... O. W. Stiegler  
Briquet binder..... F. B. Merrill  
Brooder..... E. Bates  
Broom head holder and shaper, Combined..... T. M. Gill  
Brush, Air..... W. H. Shepler  
Brush clearing implement..... F. X. Vallee  
Brush, Hair..... D. M. Newbro et al  
Brush support..... J. P. Erie  
Brushes, Making..... J. Morrison  
Brusher, Fruit or vegetable..... F. Stebler  
Bucket, Paint..... J. E. Lucas  
Bucket, Well..... G. P. Hobbs  
Buckle, Cotton tie..... D. E. Eddleman  
Building block and wall construction..... A. C. Waterman  
Bundling apparatus..... F. P. Wiseburn et al  
Burner..... R. C. H. Sieverts  
Burial caskets, Rough box for..... P. D. Skahan  
Button, Separable..... W. M. H. Jockin  
Cable, Driving..... G. S. Ingle  
Cable grip or clutch device..... L. Schuler et al  
Calculating apparatus..... C. A. N. Wallich  
Calculating device..... E. B. Alley  
Can body blank feed mechanism..... A. Lotz  
Can handling and cooling apparatus..... W. Smith  
Can washer, Milk..... T. L. Valerius  
Cant hook, Double..... E. F. Cunningham  
Car body bolster, Railway..... G. S. Hastings  
Car body bolster, Railway..... J. W. Seaver  
Car construction..... A. B. Du Pont et al  
Car coupling..... C. A. Tower  
Car door..... G. I. Barnes et al  
Car fender..... F. R. Keith  
Car fender..... J. D. Price  
Car fender..... H. P. Eskelsen  
Car friction draft-rigging, Railway..... J. J. Hennessey  
Car friction draft-rigging, Railway..... F. B. Townsend  
Car friction draft-rigging, Railway..... C. H. Wellman et al  
Car hand brake mechanism..... H. A. Paquette  
Car step, Folding..... J. F. Grika  
Car, Street..... J. A. Brill  
Car unloading plov..... I. B. Richards et al  
Car wheel..... H. Bacon  
Car wheels, tires, &c. Manufacture of..... H. C. Buboup et al  
Car, Wrecking supply..... H. H. Warner et al  
Cars, Electric illumination for railway..... M. Buttner  
Cars, Tandem spring friction draft-rigging for railway..... F. B. Townsend  
Carriage pump mechanism, Steam..... R. H. White  
Castings, Manufacturing homogeneous metal..... H. Goldschmidt et al  
Chaffer and sieve, Adjustable..... B. F. Martien  
Charging machine..... H. Aiken  
Check hook..... C. Buckley et al  
Cigar cutter, pipe tamper and cleaner, Combined..... D. S. Blanpied  
Circuit breaker, Return current..... C. C. Chesney  
Clamp for suspending books or the like..... J. B. Connolly  
Clasp..... J. H. Pilkington  
Cleaning knife, Electric..... F. Nettleton et al  
Clock, Electric..... H. Rempe  
Clock, Secondary electric..... T. H. Wurmb et al  
Coal, Apparatus for separating bone, slate, &c. from..... C. H. Boardman et al  
Coal bricks, particularly from bituminous brown coal, Manufacturing..... J. M. Schwarz  
Coin indicating device, Electrical..... R. B. Hazlett  
Collar, Horse..... A. I. Butler  
Commutating and current shaping device..... J. H. Loring  
Compass, Beam..... F. A. Traut  
Compass, Recording..... E. Hedenstrom  
Concrete body molding machine..... M. A. Winget  
Concrete mixer..... E. S. Bryant  
Conduit holder..... H. Drewery  
Conductor guard, Flexible..... G. R. Pimlott  
Conduit threading device..... A. H. Knott  
Confection dipping machine..... E. J. Jenner  
Connecting clip, Sectional..... W. C. Lyon  
Conveyer..... G. C. Horst  
Conveyer..... L. Abraham

Conveyer feeding device..... C. Mittag  
Corn husking machine..... J. W. Bellairs et al  
Corner shield..... F. A. Stevens  
Corset..... R. S. Oliver  
Coupling for drill rods, line shafts, &c..... F. J. Thoring  
Crane..... A. P. Van Tuyl  
Crane..... J. Matthews  
Crate, Collapsible folding and adjustable..... E. Hornaday et al  
Crate, Folding..... E. G. Solomon  
Cream cooler and aerator..... A. C. Lifquist  
Crusher..... T. E. Hurley  
Cultivator, Corn..... J. M. Richmond  
Current regulator..... J. P. Erie  
Cut off and drain cock, Combined..... J. H. Jennings  
Cyclorama..... J. W. Reno  
Dam construction..... O. B. Clarke  
Dampener regulator, Automatic..... H. Fatic  
Decorated surface..... A. B. Porter  
Decorated surface and producing same..... A. B. Porter  
Decorated surface, Angular..... A. B. Porter  
Dental clamp..... P. B. Laskey  
Depurator..... A. W. Ottignon  
Die..... J. M. Stetter  
Die stock..... R. Bartholomaus  
Disk drill..... W. A. Van Brunt  
Disk drill, Double, 2 pats..... W. A. Van Brunt  
Display box, Neckwear..... J. H. Louder  
Domestic boiler..... A. A. Frost  
Door closer, Spring..... H. J. Valentine  
Door switch, Safety..... E. R. Renfrow  
Draft rigging, Friction..... F. B. Townsend  
Drawer bottom support..... J. N. Eames et al  
Drawer, Cash..... H. H. Chesbrough  
Drawers supporter..... J. H. Roper  
Drill press, Multiple..... F. J. Nutting  
Dry kiln truck..... H. R. Gillette  
Dumb bell..... F. Harris  
Dye and making same, Green anthraquinone..... O. Hess  
Electric machine coil, Dynamo..... H. F. T. Erben  
Electric motor speed indicator..... 2 pats..... J. Berg  
Electric signal..... H. L. Lee  
Electric switch..... J. J. Ruddick  
Electrical loop lines, Automatic bridge for..... G. E. Brett  
Elevator..... O. Schuler  
Elevator door operating device..... M. P. White et al  
Elevator guard..... C. D. B. Fisk et al  
Elevator mechanism..... E. Wright  
Elevator safety catch..... J. Genisio  
Elevator safety device..... W. H. Wilsey  
Engine cooling device, Explosive..... M. Offenbacher  
Engine electric igniter, Explosive..... A. L. Riker  
Engine, Combination internal combustion and compressed or liquid gas or compressed or liquid air..... F. Bryan et al  
Engine fuel governor, Oil..... K. Krebs  
Engine platform, Traction..... D. R. Gardiner  
Engines, Fuel mixing and charge controlling device for explosive..... P. Gaeth et al  
Excavating machine..... F. M. Bisbee  
Excavating machine..... T. H. Garland  
Exercising apparatus, Lung P. von Boeckmann  
Exhibitor, Goods..... S. Stenger et al  
Expanding and flanging tool..... 2 pats..... L. D. Lovekin  
Expanding tool..... L. D. Lovekin  
Eye shade..... O. B. Lester  
Fastening for shoes, &c..... F. Paschen  
Faucet..... W. T. Nichols  
Faucet, Bung..... W. F. Crowley  
Faucet, Hot and cold water..... J. A. Greene  
Feeding device, Horse..... H. Still  
Feeding trunk attachment, Pneumatic..... T. R. Marsden  
Fertilizer distributor and seed dropper..... S. S. Cudd  
Filing case..... W. D. & J. D. Kelly  
Fire escape..... H. E. Smith  
Fire escape apparatus..... F. Hillier  
Fire extinguisher, Automatic..... G. E. Hibbard  
Fire pot..... E. S. Clare  
Fire resisting door..... G. E. Walter  
Firing mechanism..... R. P. Stout et al  
Fish scaler..... C. Whitford  
Flat iron stand..... M. Schubert  
Fluid pressure engine..... J. Pengilly  
Fly catcher..... C. Wenigmann  
Fly trap..... F. J. Lampton  
Folding box..... R. A. S. Bloomer  
Foodstuffs &c. Covering device for M. M. Waite  
Force feed lubricator..... B. Ivor et al  
Fruit picker..... S. H. Alden  
Fumigating and disinfecting device..... G. F. Hardinge  
Fuse circuit terminal..... L. W. Downes  
Game and game board..... H. T. Reed  
Game board..... C. H. Curran  
Game board..... H. Frank  
Gang plank and loading chute, Combined..... C. B. Hallam  
Garment hanger..... J. E. Knowlton  
Garment supporter..... F. K. Hickok  
Gas engine..... J. D. McFarland, Jr  
Gas generator, Acetylene..... J. W. Tallmadge  
Gas generator, Acetylene..... T. O. Arneson  
Gas generator, Acetylene..... W. A. Feurt et al  
Gas mixer and injector..... L. Patric  
Gas producer..... J. W. Seaver et al  
Gas regulating means..... E. E. Frederick  
Glass bulbs or globes, Frosting..... P. Kennedy  
Glass manufacture, Plate..... A. M. Gov  
Glass shearing device..... W. J. H. Fettes  
Glass tile molding apparatus..... L. R. Blackmore  
Gold separator..... D. C. Knowlton  
Golf ball..... A. W. P. Cramer  
Golf ball..... 2 pats..... C. T. Kingzett  
Golf club..... O. Heeren  
Grain drill seed tube connection..... F. R. Packham  
Grain loader..... D. Barnes  
Grain scower and separator..... W. E. Larmou  
Grain separator, Tangled..... A. A. Hamilton  
Grinding machine..... A. G. Cassidy  
Ground anchor..... J. L. Smith  
Gun mounting..... A. T. Dawson et al  
Gun sight mounting..... H. Grubb  
Hair drying machine..... E. Mink  
Ham cutting machine..... W. Lacour et al  
Hame and trace connection..... W. C. Lawson  
Hames, collars, or the like. Connection for..... W. C. Lawson  
Hammer, Electric..... A. J. Woodworth  
Harrow and cultivator, Combined..... C. Koenig et al  
Hat box..... H. Miller

Harvester side drafts. Device for preventing..... G. A. Smith et al  
Hat marker..... E. A. Burt et al  
Heater deflector..... C. Kobmann  
Heating apparatus for closed receptacles..... J. A. Waters  
Heating furnace, Coil..... R. G. Beker  
Hinge, Spring, 2 pats..... H. J. Valentine  
Hoisting bucket..... C. L. Saunders  
Hoisting gear, Equalizing draft..... J. G. Delaney  
Hoof pad..... J. Campbell  
Horseshoe..... J. E. Watts  
Horseshoe..... T. Lanston  
Horseshoe..... J. H. Stair  
Horseshoe, Cushioned..... C. T. Adams  
Hose coupling..... F. Toerge  
Hose coupling..... A. Freeman  
Hose supporter button..... V. Guinzburg  
Hot water bag..... J. Barnes  
Hydrant..... A. O. Babendrier  
Hydrocarbon burner..... H. H. Ashlock  
Illuminating structure..... F. L. O. Wadsworth  
Incandescent lighting burner..... R. Davin  
Induction coil..... C. F. Splittorf  
Ingot or casting, Metallic..... G. Thomson  
Ink roller truck, Adjustable..... M. Gally et al  
Insulated joint..... J. D. Keiley  
Insulated joint for railway rail sections..... G. A. Weber  
Jar closure..... S. T. Crissy  
Jar or analogous vessel cover..... A. L. Schram  
Jewelry..... O. L. Heintz  
Journal bearing oil carrying ring..... H. Geisenhoner  
Journal bearing washer..... A. K. Hamilton  
Journal box..... D. Yondorf  
Kinetoscope..... E. J. Rector  
Knitting machine attachment..... J. B. Hipwell  
Knob shank, Ball bearing..... C. J. Caley  
Knob spindle..... C. J. Caley  
Ladder..... P. F. Wagner  
Lamp, Hydrocarbon vapor..... W. S. Proskey  
Lamp post and connections, Street..... J. A. Bower  
Lamp, Safety..... C. P. A. Kjaersgaard  
Letter system, Return..... F. H. Mann et al  
Lever, Lock..... M. N. Kirkhuff  
Life raft..... H. S. Carley  
Light effects, Apparatus for producing colored..... A. B. Porter  
Lime sulfate making apparatus..... G. Dinkel  
Lime sulfate, Obtaining..... G. Dinkel  
Line casting machine..... W. S. Scudder  
Linotype machine..... J. R. Rogers  
Linotype machine..... J. S. Thompson  
Linotype machine..... P. T. Dodge  
Liquids from or to chambers, pipes, &c. Means for controlling the flow of..... C. Tonjes  
Lister attachment..... A. J. Wilson  
Lithographic printing rollers, Machine for covering..... C. Wagner  
Loading machine..... T. J. Phillips et al  
Logging grab..... J. J. Morris  
Loom, Narrow ware..... F. E. Zenzler  
Loom shuttle..... P. Moresi  
Loom weft replenishing mechanism..... E. A. Thissell  
Lubricating cup..... J. M. Stapp  
Lubricating device, reissue..... A. G. Elvin  
Lumber drying clamp..... G. X. Wendling  
Magnesium and calcium carbonates, Producing..... F. S. Young  
Magneto electric machine..... D. Drawbaugh  
Mail delivery box..... W. S. Isham  
Mail pouch transfer system, Railway..... W. W. Taylor et al  
Manholes for conduits, Construction of..... H. C. Baker, Jr  
Massage apparatus..... F. G. Lagerstrom, Jr  
Massage machine..... C. Pfanschmidt et al  
Meat cutter..... A. W. Johnson  
Mercerizing apparatus..... P. Jeanmaire  
Metal bending machine..... H. Geisenhoner  
Metal melting furnace..... J. J. Anderson  
Metal sheets, Machine for piling..... C. W. Bennett et al  
Metallic tie..... D. P. Crowley  
Metronome, Electric..... E. K. Adams  
Minerals, Pulverizing and cleaning..... G. C. Proppe  
Miter cutting machine..... S. Levan  
Monocycle..... H. Tolcher  
Motion of rotating parts, Means for transmission of..... C. F. Rodde  
Motor control..... J. D. Ihlder  
Mower, Cycle..... G. D. Munsing  
Musical instrument..... W. E. Haskell  
Musical instruments, Pneumatic selecting mechanism for..... W. H. Rees  
Mussel extract, Producing..... J. N. Nesso  
Napkin holder..... L. R. Le Lande  
Nut lock..... T. McCabe, Jr  
Oil from cotton seed, Extracting..... F. M. Pratt  
Oil tank..... T. W. Castleman  
Oiler..... J. H. Bennett  
Ordnance breech mechanism..... C. Holmstrom et al  
Ordnance sighting apparatus..... R. Barues  
Ore roasting furnace..... E. Swain et al  
Ore washer..... C. Carlson  
Organ..... W. E. Haskell  
Oven..... J. E. Smith  
Packing machine..... E. Duhring  
Packing mechanism..... J. A. Luethy  
Padlock..... N. W. Crandall  
Painting machine..... J. Grahn  
Paper bag machine..... W. A. Lorenz  
Paper feed..... H. Bilgram  
Paper feeding mechanism..... J. Burry  
Paper, &c. Machine for grooving..... W. P. Northcott  
Paper pulp from cotton seed hulls, Bleached..... W. C. Johnson  
Pattern, Skirt..... M. F. & E. V. O'Donnell  
Pavement repairing apparatus, Asphalt..... B. J. Sink  
Pea huller..... W. S. Broyles  
Pen, Fountain..... J. Blair  
Pencil holding case..... A. G. Blincoe  
Photographic color filters, Making..... A. Bauermeister  
Piano pedal..... H. R. Moore  
Piano truck..... A. Loeb  
Picture hanger and gas cock turner..... M. E. Kanaly  
Pictures of moving objects, Apparatus for exhibiting..... E. J. Rector  
Pigment and making same..... W. J. Armbruster  
Pigments, Making..... W. J. Armbruster  
Piling, Sheet..... L. P. Friestedt  
Pipe coupling..... A. Profitlich et al  
Pipe cutting machine..... L. N. McCarter

Pipe flanging tool..... L. D. Lovekin  
Pipe, Means for making..... A. T. Symms  
Pipe socket expander..... H. W. & J. A. Hock  
Pipes, Wall, floor, or ceiling plate for steam or other..... M. C. Rosenfeld  
Planter, Check row..... E. Shaughnessy  
Planter, Corn..... W. H. Parlin  
Plants, Machine for distributing poison on cotton or other..... J. Anderson  
Plow..... E. Jarrell  
Plow..... H. C. Morrison et al  
Plowshare upsetting machine..... W. A. Clarke  
Pneumatic drill or like machine..... G. H. Hayes  
Pool balls, Device for stripping and spotting..... J. P. O'Mara et al  
Post cap..... A. Randolph  
Printing, associating, and folding machine, Web..... R. C. Annand  
Propeller blades, Device for changing the angle of..... G. L. McCallum  
Pump, Measuring..... R. A. Kunzmann  
Pump piston, Non-corrodible..... W. H. Niemeyer  
Punch..... W. A. Bernard  
Pyrometer..... M. Arndt  
Rabbit mechanism..... W. C. Davis  
Raft..... J. G. Elderkin  
Rail locking joint..... P. F. McCool  
Railway appliance..... O. Sweat  
Railway frog..... R. Novinger  
Railway rail joint..... J. W. Gay  
Railway steam and air pipe coupling or the like, Automatic..... G. D. Pettigell  
Railway switch operating mechanism..... E. Reynolds  
Railway track connection..... W. F. Miller  
Railways or other rolling machinery, Device for decreasing the noise upon..... G. W. Stevens  
Rake and hoe, Combined..... A. C. Miller  
Refrigerator or cold storage room..... E. J. Wirfs  
Registers, Means for holding and centering the rolls of paper contained in autographic..... E. J. Barker  
Revolving body balancing device..... J. H. Hubbell  
Rheostat operated by compressed air, Liquid..... K. de Kando  
Ring tray, Jeweler's..... M. Porteck  
Roadway and vehicle for traveling thereon..... J. B. Hansler  
Rock drill..... 2 pats..... P. Reinhalter  
Rope clamp..... A. A. Newell  
Rotary engine..... M. Fleming  
Rotary engine..... C. E. & W. E. Reynolds  
Rule, Foldable..... J. A. & F. L. Traut  
Ruler..... A. Wildman  
Saddle attachment, Riding..... T. Sena  
Saddle, Cart and harness..... P. R. Pulman  
Saddle, Harness..... J. B. Tener  
Safety device..... E. S. Smith  
Sand discharging spout..... A. M. Howery  
Sash balance..... J. Foster  
Sash, Window..... J. E. Scott  
Scale..... D. J. Whelan  
Scale, Computing..... H. F. Kiner  
Scale rack..... J. N. Richey  
Screw driver gage..... W. H. Voss  
Sealing device, Bottle..... G. H. Gillette  
Sealing machine, Bottle..... N. B. Abbott et al  
Seam dampener..... W. H. Rickey  
Seed drill..... P. W. Ekstrand  
Self locking pin..... L. Pierce  
Self measuring can..... R. Barrett  
Semaphore..... L. F. Loree et al  
Sewing machine presser foot holder..... P. Diehl  
Sewing machine table, Folding..... A. Morley  
Shade and curtain pole holder..... C. McDonner  
Shade hanger, Adjustable..... L. A. Watts  
Shade, Window..... M. E. Reilly  
Shaft support..... F. Reynolds  
Shearing machine, reissue..... C. M. Palmer  
Sheet feeding machine, Pneumatic..... G. F. Leiger  
Shoe, Ventilated..... J. E. Kennedy  
Sign, Metal..... E. L. Ayers et al  
Signaling system, Wireless..... C. D. Ehret  
Siphon filler..... H. Carmichael  
Sled, Knockdown..... B. F. Rix  
Sleeve head..... L. N. Stein  
Snap hook..... R. R. Waddell  
Snow melting apparatus..... A. E. Riedel  
Snow plow..... W. F. Wheeler  
Sound reproducing machine..... J. Wellner  
Spring buffer..... F. J. Keeler  
Sprinkler head..... V. Lapham  
Square..... J. D. Witcher  
Squeegee..... J. C. W. Rofe  
Stacker, Pneumatic..... L. Holland-Letz  
Stacker, Straw..... J. K. White  
Staging, Adjustable..... J. A. Hagan  
Staking machine..... C. F. Stackpole  
Stamp mill..... R. J. Baker  
Starching machine..... G. H. Bishop  
Static machine..... H. E. & H. F. Waite  
Steam engine..... S. Sheriff  
Steam engine, Compound..... W. T. Bennett  
Steam generator..... G. R. Hingelberg  
Stencil and making same..... H. C. J. Deeks  
Stenciling or printing machine..... C. M. Hamilton  
Stethoscope instrument..... R. C. M. Bowles  
Still, Water..... T. P. Wilson  
Stone, Device for fastening metal, &c., to..... T. P. Hicks  
Stove, Heating..... L. O. Gilliland  
Strap grip or buckle..... J. H. Wallace  
Sulfur burner..... H. Blumenberg, Jr  
Switch actuating mechanism..... J. H. Fitch  
Switch stand..... A. Bulloch  
Switch throwing device..... F. A. Graham et al  
Table lock, Pedestal extension..... E. Tyden  
Telegraph relay..... J. C. Barclay  
Telegraph repeater..... J. C. Barclay  
Telegraph sounder..... J. C. Barclay  
Telephone exchange..... W. W. Woodruff  
Telephone switchboard..... C. E. Scribner  
Telpher..... H. M. Harding  
Tension device..... J. Barrett  
Thermostatic alarm..... J. E. Fortin  
Thread holder support, Cone..... H. A. Bates et al  
Three high mill..... J. Kennedy  
Threshing machine..... C. H. Bidwell  
Threshing machine and grain separator..... C. Ramsdell  
Tie and rail joint, Combined..... A. B. Snyder  
Time recording lock..... 2 pats..... A. B. Hayden  
Time, speed, and distance recorder..... R. F. G. Baxandall  
Tire..... C. Burger  
Tire, Pneumatic..... W. F. Schacht  
Tire plug, Pneumatic..... C. O. Tingley  
Tire setter and cooler..... S. Smith



Tobacco pipe.....reissue.....H. M. Willis  
 Tool. Pneumatic.....F. M. Metcalf et al  
 Toy gun .....A. Delgrande  
 Toy savings bank.....F. A. Lane  
 Traction wheel.....A. Wenberg  
 Transmitter arm.....W. Kailing  
 Transmitting intelligence.....H. Shoemaker  
 Trolley.....H. Spurrier  
 Trousers former and coat hanger.....A. Jacobs  
 Truing up work. Indicator for.....E. W. Kelley  
 Tube forming apparatus.....W. Cairns  
 Tube making machines. Adjustable skid for.....G. H. Page et al  
 Tug. Jointed hame.....C. C. Schwaner  
 Tunnel construction.....D. L. Hough  
 Type page binder frame.....W. H. Francis  
 Type writer ribbon guide holder.....E. F. Kunath  
 Type writing machine.....J. L. Cantelo  
 Umbrella attachment.....H. P. Ferroussat  
 Umbrella stand.....G. D. Human  
 Universal joint or shaft-coupling.....W. O. Worth  
 Vacuum pan.....N. Gerber  
 Valve.....C. E. Mack  
 Valve for hydraulic speed regulators. Distributing.....R. Thoman  
 Valve mechanism. Steam trap.....G. P. Stocker  
 Valve. Steam actuated engine.....S. Lundquist  
 Valve. Water cooled.....N. McConnell  
 Valve.....W. C. McKeown  
 Vapor burner.....H. S. Thornton  
 Vehicle air pump mechanism. Motor.....R. H. White  
 Vehicle brake.....H. O. Benedict  
 Vehicle jack.....A. O. Pence  
 Vehicle lantern holder.....A. C. S. Rue  
 Vehicle. Motor.....D. M. Pfautz  
 Vehicle or movable structure guarding apparatus.....I. Frank et al  
 Vehicle seat supporting brace.....G. W. Vinson  
 Vehicle spring.....F. Bosch  
 Vehicle steering device. Motor.....F. J. Tromble  
 Vehicle wheel.....J. F. Barnett, Jr  
 Velocipede. Railway.....F. Brady  
 Veneered molding or the like. Manufacture of.....O. Liepmann  
 Ventilator.....E. J. Glackin  
 Vessel bottom. Metallic.....D. A. Lisk  
 Voltage regulator.....C. E. Skinner  
 Vulcanizing apparatus.....B. W. Wittenberg et al  
 Wagon body.....W. Leppert  
 Wall.....W. N. Wight  
 Wash cabinet. Portable.....J. G. Muehl  
 Washing machine.....W. S. Barager  
 Watch holding case.....J. Counter  
 Watch roller and hands remover.....O. O. Aune  
 Water closet seat. Automatic.....W. S. Johnson  
 Water gate.....H. G. Brooks  
 Water gate.....L. Winans  
 Waterer. Stock.....F. Horwart  
 Weather strip. Metal.....J. C. McMahon  
 Well drilling machine.....G. D. Loomis  
 Wheel.....R. S. Bryant  
 Whetstone. Self-oiling.....F. Reissmann  
 Window fixture.....W. Labelle  
 Wire bender.....C. M. McFatridge  
 Wire clenching nail.....G. A. Curtis  
 Wire stretcher.....H. S. Workman  
 Wood bending machine.....W. B. Hicks  
 Wood cleaner and renovator.....E. Wilding et al  
 Wrench.....W. P. Thompson  
 Wrench.....H. G. Dunston  
 Wurtzilite for paints, varnishes, &c. Treating.....S. R. Whitall  
 Wurtzilite, rubber, &c. Composition of.....S. R. Whitall  
 Yoke. Neck.....H. F. Bundy

## DESIGNS.

Bottle.....T. A. Kochs  
 Box covering.....F. L. Daggett  
 Box. Paper.....P. B. Myers  
 Brushes, mirrors, &c. Back for.....H. Hilbom  
 Coal hod.....F. T. Brosi  
 Crumb scrapers, &c. Handle for.....E. Bachle  
 Dishes, &c. Mounting for.....S. H. Levenworth  
 Handle for vessels, &c.....2 pats.....E. Bachle  
 Ornament for vessels, &c.....E. Bachle  
 Picture frame.....C. D. Golden  
 Receptacle handle.....E. Bachle  
 Receptacle spout.....E. Bachle  
 Tiling.....W. W. Henry  
 Type. Font of.....W. F. Capitain  
 Watch charm.....J. C. Miller

Issued July 28, 1903.

## MECHANICAL PATENTS.

Abrading material. Tool for holding.....M. E. McAfee  
 Acid. Making sulfuric.....G. Gin  
 Advertising device.....J. D. Smith  
 Air compressors. Controller for hydraulic.....W. J. Linton  
 Air inlet. Fresh.....R. S. Watson  
 Air to buildings. Apparatus for supplying cool.....A. Siebert  
 Alkaline earth dioxids. Making hydrates of.....G. F. Jaubert  
 Amalgamator.....G. C. Scott  
 Amalgamator.....T. H. Hicks  
 Angle bar and rail shoe combined. Graduated reinforced.....G. H. Williams  
 Axle.....J. E. Spencer  
 Axles. Machine for turning down spindles for wagon.....P. Wallenstein  
 Baby walker.....J. L. Phillips  
 Bag fastener.....W. H. Slattey  
 Bait. Spoon.....J. R. Harlow  
 Balls. Making playing.....C. T. Kingzett  
 Band fastening.....J. H. Christopher  
 Bank. Coin registering.....J. F. Healy  
 Bark from standing trees. Apparatus for removing.....W. P. Kidder  
 Bark splitting machine. Multiple.....H. L. Staley  
 Basket for holding tin scraps.....M. Laerno et al  
 Bathometer or ship's log.....E. S. Wheeler  
 Bearing. Roller side.....A. G. Steinbrenner  
 Bearing. Side.....G. L. Harvey  
 Bed or couch bed. Extension.....A. de PinicMallet  
 Beer. Apparatus for converting wort into.....C. Spindler  
 Berth. Sleeping.....E. Dawe  
 Bicyclist's strength testing machine.....R. W. Blaisdell  
 Boiler tube cleaner.....C. B. Risley  
 Book trimming machine.....C. W. Lovell et al

Bolting or other machines. Feeding device for.....R. A. Stubbs  
 Bookcase. Sectional.....A. J. Gilmour  
 Boring machine.....F. & R. Croft, Jr  
 Bottle.....A. Boisclair  
 Bottle attachment.....C. J. Rowe  
 Bottle cap.....H. D. Jones  
 Bottle closure.....R. A. Hall  
 Bottle filling machine.....W. E. Brown  
 Bottle. Non refillable.....F. Jost  
 Bottle. Non refillable.....I. Morgenroth  
 Bottle unstoppering device. Aerated water.....R. W. McGowan  
 Box.....A. Bauer  
 Bracket.....H. G. Voight  
 Bracket holder.....G. F. Price  
 Brake head.....J. J. Kinzer  
 Brake retainer. Automatic driver.....W. Hamilton et al  
 Brake shoe.....2 pats.....J. J. Kinzer  
 Brick or article. Refractory.....F. J. Tone  
 Broom attachment.....I. P. Kilgore  
 Brush backs. Machine for placing material in.....C. W. Smith  
 Brush. Fountain.....G. C. Madison  
 Buckle.....H. Engelman  
 Burglar alarm. Electric.....S. Schwarzschild  
 Burner globe holder.....G. F. Klemm  
 Button molding machine.....A. C. Dodge  
 Buttonhole cutting and stitching machine.....E. B. Allen  
 Cable laying device. Submarine.....B. Roberts  
 Call. Carriage.....T. J. Gorman  
 Camera stand.....J. H. Smith  
 Camera stand.....J. H. & J. A. Smith  
 Can body making machine.....E. Zeh  
 Cannon.....W. H. Vivian  
 Cap. Bathing.....H. Lemmermann  
 Car and car truck bolster.....S. P. Bush et al  
 Car and car truck bolster.....S. P. Bush  
 Car. Burglar proof mail and express.....C. Zimmerman  
 Car cinder guard.....L. C. Maxson et al  
 Car coupling.....J. Timms  
 Car coupling.....S. P. Bush  
 Car coupling.....S. K. Dunkle  
 Car coupling.....W. A. Palmer  
 Car coupling.....J. Timms  
 Car. Dumping box.....G. E. Simonton  
 Car fender.....A. Miesse  
 Car fender.....D. B. Dibble  
 Car grain doors. Device for fastening.....F. H. Bennett  
 Car. Mine.....W. H. Roach  
 Car record device.....J. R. Cavanagh et al  
 Car replacer.....W. H. Pritchard  
 Car seat.....J. S. Johnston  
 Car spring bumper, draw bar, and automatic coupling. Mine.....R. S. Weitzell  
 Car wheel fender. Railway.....F. Schwinger, Jr  
 Carbureter. Explosive engine.....W. A. Gill  
 Carbureting apparatus. Air.....A. S. Avery et al  
 Card punching machine. Jacquard.....M. Mertens  
 Carpet cleaner.....E. B. Ferris  
 Cartridge. Safety blasting.....T. F. Durham  
 Cast off.....C. R. Harris  
 Cement molding apparatus.....L. G. Haase  
 Cement plaster. Composition of matter for.....A. De Monco  
 Change feed mechanism.....2 pats.....J. Edgar  
 Check protector.....E. Ocumpaugh  
 Chimney cap.....J. L. Woodside  
 Christmas tree.....A. H. Zahl  
 Churn.....J. G. Frederick  
 Cigar cutter and mirror.....J. W. Farley et al  
 Circuit closer.....T. A. Long et al  
 Circuit controller.....W. W. Alexander  
 Clamp.....2 pats.....F. J. Herbert  
 Clasp.....W. T. Spillane  
 Clock. Self-winding electric.....C. M. Crook  
 Clothes drier.....R. Shull  
 Clothes pin machinery.....R. Richardi  
 Clothes pounder.....S. Harper  
 Cluster switch.....H. Hubbell  
 Clutch.....J. H. Moss  
 Clutch. Cone.....A. C. Krebs  
 Clutch. Planter.....W. L. Beal  
 Cock. Gas.....G. A. B. Ahausen  
 Coin holder.....A. G. Bowen  
 Coke receiver and loader.....J. M. McClellon  
 Collar turning and dampening device.....C. C. Gridley  
 Combing machine.....C. F. Ainsworth et al  
 Composing or like machines. Machine for producing perforated strips for.....J. Lagarde  
 Compressing material into form. Machine for.....H. J. Flood  
 Concrete mixer.....D. Erter  
 Condensing apparatus. Steam.....C. V. A. Eley  
 Confection making apparatus.....J. Friend  
 Cord making apparatus. Covered.....A. C. Buschner  
 Cord tip.....J. R. Barrett  
 Cork.....H. Helbing  
 Corn shocker.....J. M. Shively  
 Corset.....J. Siegel  
 Cotton press.....J. T. Fuller  
 Couch. Box.....H. M. Bedell  
 Coupling.....E. O. Warner  
 Coupling pivot pin.....C. A. Tower  
 Crank and yoke connection.....F. C. Olin  
 Cuff.....C. H. Knapp  
 Cultivator. Garden.....D. H. Moore  
 Cultivator. Riding or walking.....W. L. Beall  
 Cupidator. Sanitary pocket.....J. Tobin  
 Dam.....N. F. Ambursen  
 Dental crown splitter.....G. K. Heist  
 Die.....F. E. Smith  
 Digging machine.....H. Sorensen  
 Dilating bougie.....F. R. Bachler  
 Disinfection apparatus.....A. Ghirelli  
 Display rack.....D. Sullivan  
 Display table.....C. W. Winfield  
 Door check and spring.....V. Beauregard et al  
 Doubletree clip.....C. W. McGlashan  
 Dough. Raising.....J. W. Garrick  
 Drawer support.....A. A. Anderson  
 Drill bit. Rock.....H. Collins  
 Dust collector.....R. W. Southerland  
 Dwelling block.....M. F. Peirce  
 Dye and making same. Blue anthraquinone.....E. Hepp et al  
 Edge setter.....E. I. Williamson  
 Egg tester.....F. W. Wilson  
 Electric accumulator. Portable.....L. A. Lammerts  
 Electric battery.....3 pats.....H. H. Halsey  
 Electric battery.....H. Csanyi  
 Electric battery.....2 pats.....H. Halsey  
 Electric circuit breaker.....M. Skinner

Continued in September number.

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

Foreign patents may also be obtained in certain other countries.

**FREE!**

Send us 2 cents to pay for postage and we will mail you a valuable copyrighted book, "How to obtain Patent, Caveat, Trade-Mark and Copyright Protection, with Decisions in Leading Patent Cases" entirely free of charge. Address:

**INVENTIVE AGE PUBLISHING COMPANY,**  
 (Dept. P.) WASHINGTON, D. C.

## Drawings for Inventors.

If you want copies of the drawings of your patent, we can procure them at these prices:

12 copies, each sheet full size (8x13)	\$ 2.50
25 " " " " " "	3.50
50 " " " " " "	4.50
100 " " " " " "	7.00
500 " " " " " "	13.00
1000 " " " " " "	17.00

12 copies, each sheet reduced 1/4 (8x5 1/2)	\$1.25
25 " " " " " "	2.00
50 " " " " " "	3.00
100 " " " " " "	4.00
500 " " " " " "	7.50
1000 " " " " " "	9.00

These copies will be made by the photo-lithographic process, by the same firm which photo-lithographs the Patent Office work, and will be equally as good as the drawings accompanying your letters patent. Five hundred copies of your patent would cost you at least \$25. We can furnish 500 copies of the drawings, if contained on one sheet, for \$13 full size, or \$7.50, if reduced one-third, the same reduction as your letters patent drawings. Your valued orders solicited.

**The Inventive Age Publishing Company,**  
 WASHINGTON, D. C.

**The Manhattan**  
**Typewriter,**  
**Guaranteed to be of the**  
**Highest Grade.**

**NOT IN THE TRUST.****PRICE \$50.****JOHN C. PARKER,**

619 Seventh St. N.W., Washington, D. C.

## Attention Inventors!

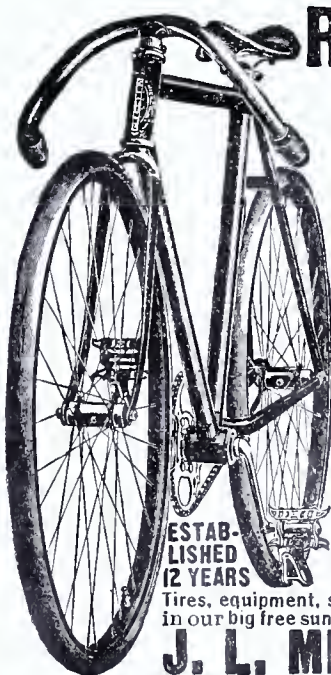
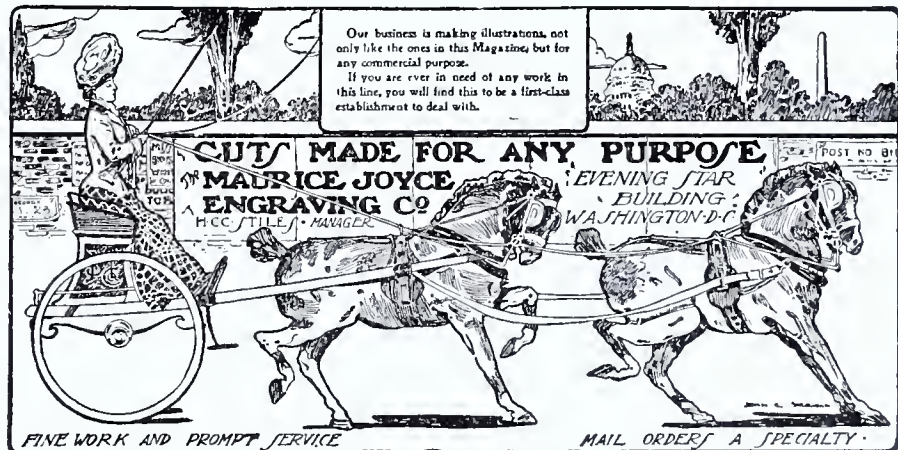
LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

**Charge one dollar.**

In ordering, please state specifically the class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.

**RIDER AGENTS WANTED**

in each town to take orders for our new High Grade Guaranteed Bicycles.

**New 1903 Models**

"Bellise,"	Complete	\$8.75
"Cossack,"	Guaranteed High Grade	\$10.75
"Siberian,"	A Beauty	\$12.75
"Neudorf,"	Road Racer	\$14.75

no better bicycle at any price.

Any other make or model you want at one-third usual price. Choice of any standard tires and best equipment on all our bicycles. Strongest guarantee.

We **SHIP ON APPROVAL** C. O. D. to any one without a cent deposit and allow **10 DAYS FREE TRIAL** before purchase is binding.

**500 Second Hand Wheels \$3 to \$8**

taken in trade by our Chicago retail stores, all makes and models, good as new.

**DO NOT BUY** a bicycle until you have written for our tires, equipment, sundries and sporting goods of all kinds, at half regular price, in our big free sundry catalog. Contains a world of useful information. Write for it.

**J. L. MEAD CYCLE CO., Chicago, Ill.**



AN ELEGANT REPRODUCTION OF A CHARMING

# \$75,000.00 Painting

Given Away



REDUCED ILLUSTRATION

"THE VILLAGE WEDDING"

FULL SIZE 25 BY 38 INCHES

FOR several years the publishers of the WOMAN'S HOME COMPANION have been searching for something, to give to their subscribers, that would ECLIPSE ANYTHING EVER OFFERED BY ANY PUBLISHING-HOUSE IN THE WORLD. At last, at great expense, they are able to make it possible for every home in America to possess a magnificent and faithful reproduction of one of the most remarkable paintings ever produced by mortal man in this or any other age. It secured for the artist the honor of immediate admission to the ranks of the Royal Academy. The original painting was shown all over Europe, and thousands upon thousands of people gazed upon it with rapture. It was quickly bought up for \$75,000.00, and placed in the position of honor in one of the most celebrated galleries in Europe, and no American money yet offered has been able to secure it for this country. The whole picture fascinates one with its absolute accuracy to life. Every figure in itself alone is a study that would make a wonderful picture. Every face is alive with the spirit of action. It is a picture of mirth and merriment; a picture to bring sunshine into every home and the heart of every one who gazes upon it. You cannot tell our engraving from the only other authorized reproduction, which sells in Europe for \$18.00 (eighteen dollars). Our exquisite reproduction is 25 by 38 inches, including margin, the exact size of the costly European engraving, and will be a splendid addition to the art collection of any home, whether framed or hung without framing, a fashion now so much in vogue.

**WOMAN'S HOME COMPANION** This magazine is edited and made up in the city of New York, the leading literary and art center of America. It contains the most timely illustrated articles, the most beautiful illustrations, the best short stories, the most popular serial stories, the most practical household departments, the best of everything desirable for a home magazine. It is printed on the finest paper, has 44 to 60 large pages, 11 by 16 inches. The twelve numbers will contain more than one thousand beautiful illustrations. Each month it carries a message of help, profit, pleasure, education, culture and refinement to over two million readers. Its editors and contributors are the most popular American writers. It is altogether the cleanest, brightest, handsomest, choicest and best of American home magazines.

**\$7.00 for \$1.85**

"THE VILLAGE WEDDING,"	very, very cheap at \$5.00	A total value of \$7.00
WOMAN'S HOME COMPANION	one year, price 1.00	
INVENTIVE AGE & PATENT	one year, price 1.00	
= = INDEX = =		

**BOTH PAPERS ONE YEAR AND THIS PICTURE SENT TO ANY ADDRESS**

**For Only \$1.85**

In this offer, although paying less than the ordinary and regular price of the papers for a year, you get in addition the above-described charming picture ENTIRELY FREE.

The papers and picture in the above offer can go to different addresses.

THE ABOVE OFFER APPLIES TO OLD OR NEW SUBSCRIPTIONS.

SEND ALL ORDERS TO

**INVENTIVE AGE PUBLISHING COMPANY.**  
WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

# THE Inventive Age

AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 9.

WASHINGTON, D. C.—SEPTEMBER, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

## COTTON MANUFACTURING IN CHINA.

THE question—still unsettled, in spite of sundry specious promises and protests—as to whether Russia will maintain an open door in that part of Manchuria which has come under her control, is of vital importance to the trade of a large section of this country. The policy of splendid isolation, of non-interference with the politics of European and other foreign countries, ceased to be feasible for this country when our goods entered outside markets in growing quantities, and when our exporters showed their willingness to accept pounds sterling, marks, francs, rubles, pesos, yen and taels in payment for them, instead of American dollars only. The branches of commerce that are most concerned in finding an outlet for their products in China and Manchuria, are wheat and flour, kerosene, and cotton goods. Russia, with her apparently inexhaustible supplies of petroleum on the Black Sea, will make every effort to supply this article to the exclusion of

—it will be a long time before our shipments of grain and flour will be curtailed by the local output. The lack of modern machinery, of methods of transport, of the energy and "hustle" that are necessary to success in every line of effort, will make it possible for the United States to feed the swarming millions of China for

well adapted to the needs of the Chinese people, that it has gained a strong foothold in the Empire, and is preferred to any other. Especially is this true in Manchuria, where the climate is cold, falling in many parts to 20 or 50 degrees below zero. It might be expected that with such conditions of temperature woolen goods would be the natural wearing apparel of the population, but such is not the case. Padded cotton and cotton flannel garments, with sheep and goat skins, constitute the bulk of the clothing of the poor classes, while padded

ity of native competition. The yellow peril has always been a favorite bogey with economists of a certain class. A few years ago, the world was trembling at the predictions that civilization would be some day overwhelmed by the hordes of the East, as Rome had been smothered by the Goths and Vandals. When recent wars demonstrated that mere numbers could not cope with science and the weapons evolved by modern intelligence, the bugbear was buried, only to rise again, later, in the guise of a threat to industrialism. The cheap labor of the

Eastern countries, we were assured, could produce goods at prices with which our workmen could not hope to compete. Japan was pointed out as an instance of this danger. With the adaptability, the powers of imitation of the Japanese, with their eager desire to learn Western methods, with their facility for living on a cent or two a day, and their alacrity to accept for a week's work a sum of money that a negro waiter would scorn as a tip, would they not be able to undersell the high-priced labor of America? The argument was so plausible that it took time to show that cheap labor is really the most ex-



THE FRENCH ORPHANAGE AT LIKAWEL, SHANGHAI, SHOWING COTTON SPINNERS AT HAND SPINDLES  
AS USED BY CHINESE WOMEN IN COTTON PROVINCES.

all foreign competition. In the other two lines (provided that no discriminating tariff is imposed) the United States has a better chance of success. We have been assured, it is true, that the plains of Manchuria and of Siberia are admirably adapted to the production of wheat; but according to the opinion of one of our most prominent railway presidents—a man who has had sufficient experience in Eastern trade to make his views authoritative

years to come, and to extend this trade indefinitely, as a taste for corn and wheat products is inculcated, and these gradually take the place of the rice that has been the proverbial diet of the masses in the Orient.

The prospect for cotton in the Far East is even brighter. It may not be generally known that the cotton mills of the South, located in the midst of the fields where the plant grows, turn out a cotton cloth so cheap and so

silks and furs are worn by the rich. Enormous quantities of our cotton drills, jeans and sheetings are therefore shipped to Northern China and Manchuria: in fact, we sell more cotton goods to China than to all the rest of the world. To maintain this trade free from hindrance or drawback, therefore, is of great importance to this country.

One drawback that pessimists have not failed to point out, is the possibil-

pensive, and that skill and machinery can turn out articles at a price that will always bring bread to the mouths of our workingmen. Nevertheless, the bogey still survives, and appears at intervals. The last apparition is in the supposed menace to our trade in China, through the development of native manufactures. It may be of interest to look into the condition of the cotton manufacturing industry in that part of the world.



Several mills for spinning yarns have been erected in Shanghai and Wuchang, the output of which is not large, nor are the profits regular. The yarn from these mills, or that brought from India, is manufactured into cloth by the Chinese on hand looms. The production of cotton in China amounts perhaps to 6 or 7 million cwt per year, and this goes mainly to local mills. The accompanying illustration shows a field under cultivation, with women picking the cotton.



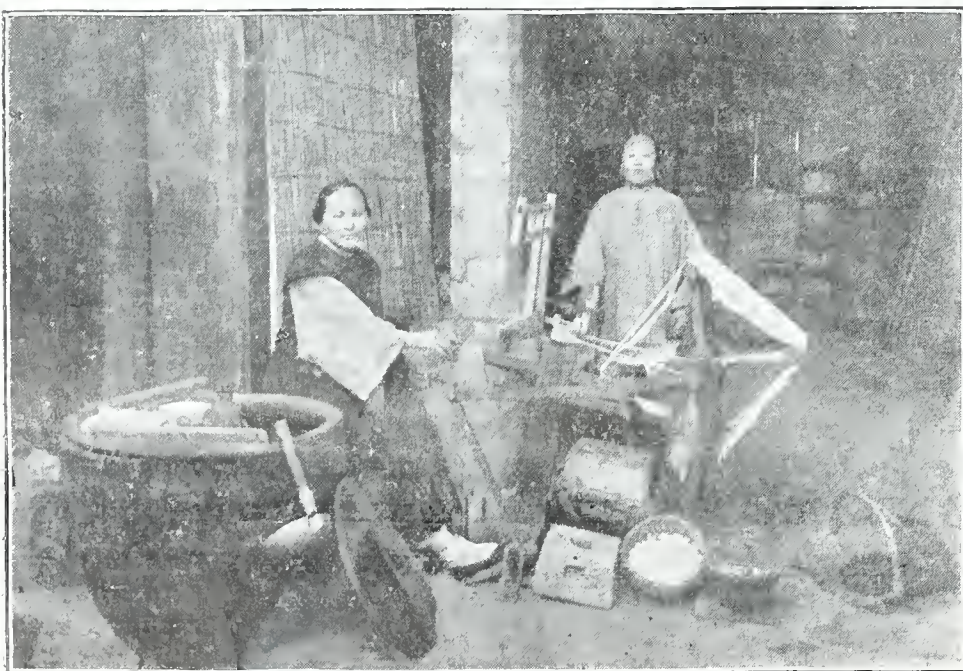
CHINESE COTTON FIELD, SHOWING GROWTH AND CULTIVATION OF COTTON, COTTON PICKING.

This plant is not cultivated in China as in the United States. The ridges are wide, like those of an American wheat field; the plants are thick, and the Chinese farmer cultivates every plant to full maturity. Consequently, when grown, the stalk is small and the limbs few, on account of lack of space to develop. To look at an acre of Chinese cotton when full grown gives an impression of great yielding capacity, which the actual output is far

wages are almost nominal. It must be assumed, however, that production is proportionately cheap. One American will attend to as much machinery as three or four Chinese. The native workman will not push the machinery, and they are careless, which causes time and money to be lost in repairs. The hours of work are long, but the Chinese do not work consecutively and steadily. A working day in China is divided about equally between working, singing, gossiping and eating.

The small-footed women must sit down often to rest their maimed extremities: the larger-footed women demand equal rest.

The cotton, when spun, is taken to the homes of the workmen, and there manufactured into cloth on looms of native construction. The illustration below is a view of one of these hand looms, with the laborers. Only sporadic attempts have been made to develop this industry beyond the stage



NATIVE HAND LOOM.

from fulfilling. The thickness of the plants causes many of the bolls to wither in the shade, and also prevents many from maturing. The hoe used for working cotton is very narrow, in order that the laborer may thread his way between the thick-standing plants.

Women also constitute the bulk of the employees in the mills, and their

of home enterprise. The picture on the front page shows Chinese children spinning cotton at a French orphanage near Shanghai.

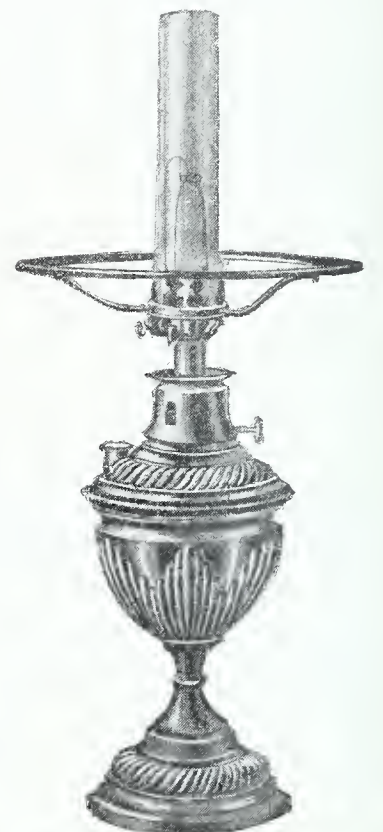
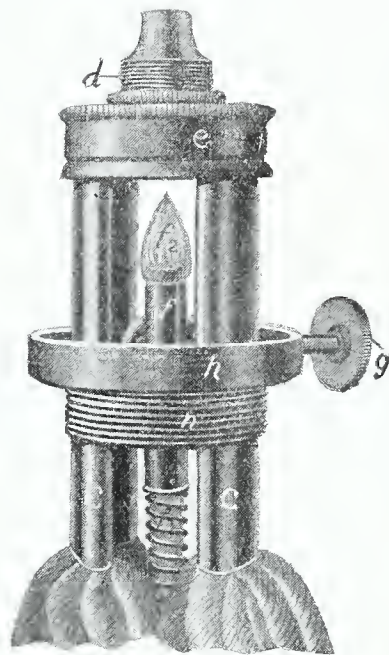
With these primitive methods and appliances, it may be seen that the American cotton mills have little to fear from Chinese competition in the near future.

## Alcohol Lamps.

ONE of the many uses to which alcohol is applied abroad more widely than in this country, is that of illumination. Alcohol supplies to a large extent the place of kerosene in Germany and France, and is said to have many advantages over the latter, in point of cheapness, brilliancy and safety. The accompanying illustrations show an alcohol-burning lamp that is popular across the water, called the Auer incandescent light.

The burner of this lamp, it is said, can be fitted to the basin of any lamp, provided the font does not admit air from below. It is safe against explosion when handled with the ordinary care required in the manipulation of all fuel fluids. The light emitted is pure white, and beneficial to the eye; no odors are generated during combustion: and the lighting power is equal to that from 18 to 70 candles, accord-

not be less than 90 per cent. A basin which has previously contained kerosene oil must, of course, be carefully cleaned before the alcohol is put in it. When the wicks are soaked with alcohol, which will take about fifteen minutes, the heating wick is lighted. The flame which is kept burning as long as the lamp is used, heats the sucking tubes which surround it, and the gas chamber above it. The thus developed alcohol vapor collects in chamber, e, and after about two minutes it passes through the tuyere, d, mixes with the atmospheric air, and reaches the head of the burner. It is then lighted from above the glass cylinder, bringing the incandescent mantle into a glowing state.



ing to the size of the burner. It consumes less than half a cent's worth of alcohol per hour, so that its cheapness is readily demonstrable.

The essential parts of the Auer alcohol incandescent light are: the evaporating apparatus (see sketch), the burner itself with cylinder-gallery, and the head of the burner. The evaporating apparatus consists of two flat sucking tubes, c, and the chamber, e, in which the alcohol is turned into gas. On the chamber the tuyere, d, is fixed. In the centre of the two curved sucking tubes, c, is a tube, f, for the heating wick, which is fixed between a spiral spring. Round about half way of the sucking tubes a flange, h, is to be found, over which the protecting mantle hangs.

The latter finds its support on chamber, e, showing a small opening one side, through which the heating wick is to be lighted. Below the flange, h, is a screw, the same as is used on all kerosene lamps. The incandescent mantle is exactly the same as that used for gaslight, and the apparatus for supporting the mantle is screwed on to the tuyere. To protect the tuyere tube against a sudden drop of the flame a small cup covers it. To work the apparatus it is screwed on a font filled with alcohol, which must

The lamp is extinguished by putting out the heating flame. After the extinction of the light it is best to screw back the wick a little, by which means the evaporation of alcohol will be prevented, while the lamp is not in use.

When the light flickers, this indicates that the heating flame is kept too low, so that not enough gas is produced. When a bubbling noise is made by the burner, the flame is too large and more gas than required is being produced, which is to be counteracted by reducing the flame.

### A Mosquito Plant.

The Deutsche Kolonial Zeitung reports the finding in North Nigeria of a plant (*Ocimum viride*) two or three of which, when placed in a room or on a veranda, will remove mosquitoes. The effect is produced by the odor exhaled. This resembles thymian and eucalyptus. The natives extract an essence from the plant that is an excellent substitute for quinine. It is not only equal in its effects, but it lacks many of quinine's disagreeable attributes. The Deutsche Ostafrika Zeitung reports that a great many natives are familiar with a mosquito plant, called by them "rumbasi," which has similar properties to the one above described.



### Fires From Electric Wiring.

One of the most difficult things an electrical insurance department has to do is to prove to the lay mind that an installation which has been in use for several years is in unsafe condition owing to the poor condition of the insulation. The claim is made, and perhaps rightly, that the equipment has not given any great amount of trouble, and it is, therefore, difficult to convince the assured of the possibility of fire from electrical causes, as they fail to appreciate the fact that the efforts of the fire department are directed towards the prevention of fires, rather than in determining the cause or origin of a fire after it has occurred.

The old saying that "familiarity breeds contempt" is most applicable to the average electrical equipment when under the supervision of persons who know nothing of the inherent danger of the system. As a rule, no sooner is an equipment completed, than more or less extensive changes and alterations are instituted, these additions and changes being made without any regard whatever to the ordinary precautions which are supposed to be taken in connection with electrical work.

It is a common thing to find on the average equipment, after it has been in service a short time, the panel-boards or cut-outs, which, for protection, were encased in cabinets constructed of, or lined with, slate, iron, or similar material, used as storage closets for waste, rags, paper and other combustible things. When the enclosures are too small for this purpose, the doors are either left open or removed, and material of the most combustible nature is stored in direct contact with open fuses, bare bus bars and switches.

The ease with which an electric light or fan can be installed at any point in a building, or with which changes can be made in the position of a lamp, using for this purpose a flexible cord and connecting it to the most convenient source of supply, is perhaps one of the most common and flagrant violations of prescribed rules. As it requires but a short time, usually, for the insulation on this cord to become abraded, or so dry and hard as to break at any point where it may be disturbed, it can be seen that this condition is likely to result in trouble at any place on the circuit.

The use of large copper wire and extraordinarily heavy fuses in cut-outs, after the fuse originally installed has operated, is on the same order. This can be compared in recklessness only to the tying-down of the safety valve on a steam boiler. A little knowledge of electricity and the laws which govern it in its application to power and lighting systems, well seasoned with ordinary common sense, would enable almost anyone to understand the average precautions necessary in the safe-guarding of electrical wiring and apparatus; and if this knowledge, so seasoned, were only occasionally applied, the fire losses from electrical causes would be largely diminished — *Cassier's Magazine*.

## RAILWAYS IN - - - - - THE PHILIPPINES.

THE plan, which now seems in a fair way of being realized, to construct a network of railways in the Philippines, renders interesting a consideration of existing means of transport. Ways of communication between the towns and villages in the islands consist of cart roads, horse trails, or footpaths. On the island of Luzon, Manila is the center of a system of intercourse by highways constructed with an idea of providing continuous lines of trade and transportation. From these central lines, paths or trails branch in every direction to the towns on the different bays, ports and harbors.



FOREST RAILWAY IN THE PHILIPPINES.

The only railway in the archipelago now existing is one running from Manila to Dagupan, 123 miles. A steam tramway also extends from the capital to Malabon, and there are private lines connecting mines in certain of the islands. It is believed that 1,000 miles of railway will be sufficient for the present to meet the requirements of the islands. It is proposed to build a trunk line 600 miles long through the entire length of Luzon: to extend the existing road from Manila to Dagupan through the China sea coast provinces, northward, to Laoag, about 200 miles further; to construct a line across the island of Luzon, with Manila as its starting point—a distance of about 100 miles: and to build short feeders as conditions and traffic warrant.



RAILROAD BRIDGE, JUST AFTER BATTLE OF BAGBAG RIVER, RIZAL, LUZON,  
APRIL 25, 1899. ENGINEER BATTALION BUILDING STEPS  
FOR PASSAGE OF TROOPS.

The accompanying illustrations show—1. A forest railway, in which water buffalo is used as means of propulsion; and 2, the railroad bridge across the Bagbag river. The view was taken just after the battle of April 25, 1899, and shows the engineer battalion building steps for the passage of troops.

### Bricklaying in Winter.

It has been demonstrated in Sweden that bricklaying can be carried on in a temperature as low as 16° F. For lower temperatures it is necessary to heat the sand and water used in making the mortar. The heating of the water is easily accomplished, and for the sand the common arrangement consists of a circular iron tube 18 to 24 inches in diameter and 6 to 8 feet long. This is closed at one end with bricks or an iron plate. On the top at this end there is a chimney 8 to 10 feet high and 5 to 6 inches in diameter. The fuel, which is generally refuse wood from the building under erection, is fed in at the open or partly open end of the cylinder. This cylinder is often formed of an old boiler tube or of a piece of an old iron chimney. For burning coal, special grate and chimney arrangements would be necessary, but in no case need they be elaborate or expensive. After placing this cylinder on the ground, the sand is heaped on and around it to a depth of 18 to 24 inches and allowed to remain till it gets hot, when it is taken away from where it is hottest and replaced by fresh sand. The mortar should be made in a room where the temperature is kept well above freezing point, and regulated according to the frost to be counteracted. Generally this room is made by roughly boarding in a part of the scaffolding, simplicity and cheapness being desirable. In laying the bricks care should be taken to avoid shifting them after once being set in the mortar, and old or stale mortar should never be used.

### New Galvanic Batteries.

A new German patent relating to galvanic batteries of the class which is composed of a series or plurality of separate dry cells, has been issued. The improvements cover the production of a battery which is capable of being kept in store, of being transported in an absolutely dry condition, and of being rendered fit for use at a moments notice by the introduction of a suitable liquid or electrolyte into the separate cells constituting the battery. The object aimed at appears to have been secured by certain novel features of construction and combination of parts.

The dry cells consist each of a zinc or other metallic cylindrical electrode, and of a carbon electrode having a cylindrical or prismatic cross-sectional area placed within the metallic cylinder. The space between the two electrodes is filled up with blotting paper or other suitable material capable of absorbing the electrolyte. A plurality of these cells is arranged within a suitable socket or frame-shaped casing the cells being separated from each other and the surrounding casing by asphalt or other insulating material. When required for use, the covers are removed from the cells and filled up with the blotting paper soaked with any convenient electrolyte, such as ammoniac solution, etc. The covers are then replaced and the battery is ready for use. Insulating rings at the open ends of the cells or zinc cylinders prevent short circuiting of the cells by any overflowing electrolyte.

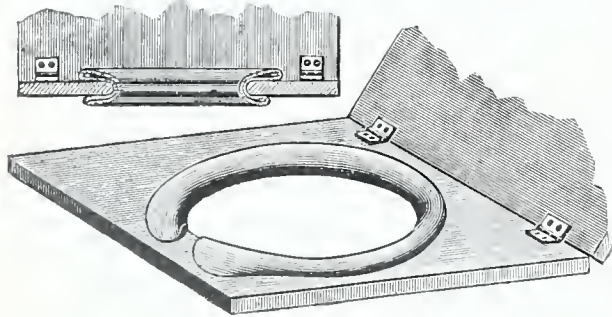


## CLEVER NEW PATENTS.

### The Powers Water-Closet Seat Protector.

An Unusual Opportunity for Investment.

This invention relates to water-closets, and has for its object to produce an attachment for the seat in the form of a cushion or protector which may be readily attached or detached to serve as a supplemental seat or cover to the seat. It consists of an expansible wire frame adapted to embrace the seat and likewise support the fabric cover and maintain it in position to be readily attached and detached. The wire frame is constructed of a single piece of wire bent into a substantially U form with spaced sides as shown in the smaller figure of the accompanying illustration. The extremities of the leg members of the frame are extended inwardly, leaving a space between the ends which will come opposite the front of the seat. The wire frame is adapted to be "sprung" into



engagement with the seat, and will possess sufficient resiliency to maintain it in position by its own expansive force, but which will yield to a force sufficient to dislodge it.

The frame is to be provided with a fabric covering, conforming to the shape of the frame and the seat upon which

it is to be used, and which will be in the form of a substantially U-shaped tubular envelop closed at the ends and entirely concealing the wire frame, as indicated. By this simple arrangement, when the frame is sprung into engagement with the seat, the fabric envelop will form a border around the interior of the seat, except a short gap at the front, and will entirely protect the user not only from contact with the cold seat, but also from any possible contamination therefrom. The protector when on the seat does not interfere with the folding of the seat. Its expansive force enables it to conform to various sizes of seats.

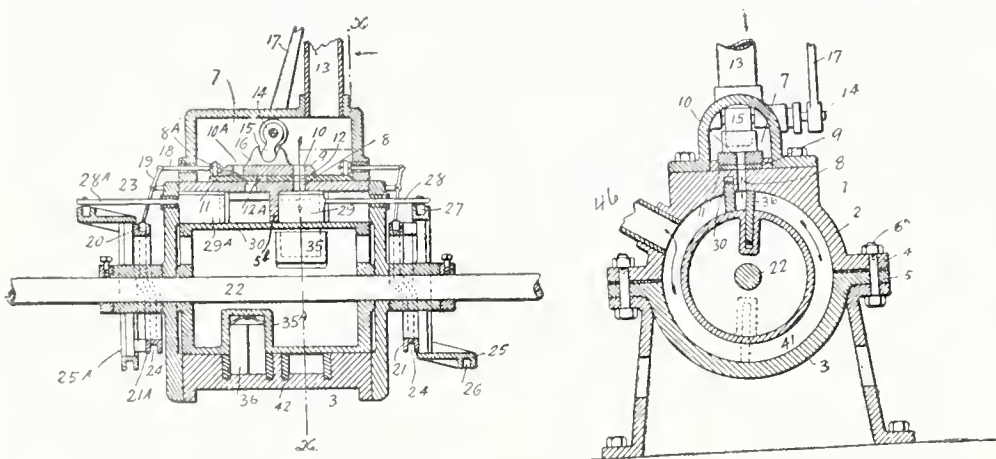
The device may be found especially valuable in hospitals, sanitariums, and for the use of invalids and delicate persons.

The protector may be formed of any size and of any suitable material and may be manufactured at very small cost. It may be made so as to fold or telescope so as to occupy a small space. They may be carried by travelers, tourists, or other persons, and are so inexpensive and simple in construction and so readily attached and detached as to add practically nothing to the burdens of travel. A number of the devices may be provided for each closet to enable them to be frequently changed when necessary, or to provide each person using the closet with a separate protector, thereby providing each person practically with an individual closet.

Rights under this patent may be secured from the inventor and patentee. He will sell outright or have them manufactured on royalty. Address, James A. G. Powers, 1522 Grand Ave., Joplin, Mo.

### New Rotary Engine.

Mr. Robert B. Chritton, of Enid, Oklahoma Territory, who is well known as the inventor of several novel rotary engines, has recently obtained a patent on other improvements in this art. The new engine consists of a cylinder 3, through which extends a shaft 22 carrying a rotary piston. The interior of the cylinder is sub-divided by an annular partition into two compartments, and the piston carries sliding abutments 36, working respectively in the compartments. Co-acting with the abutments are sliding valves 29 operated by an external cam secured to the shaft and having link connections therewith, these valves being provided with novel steam packing. Located

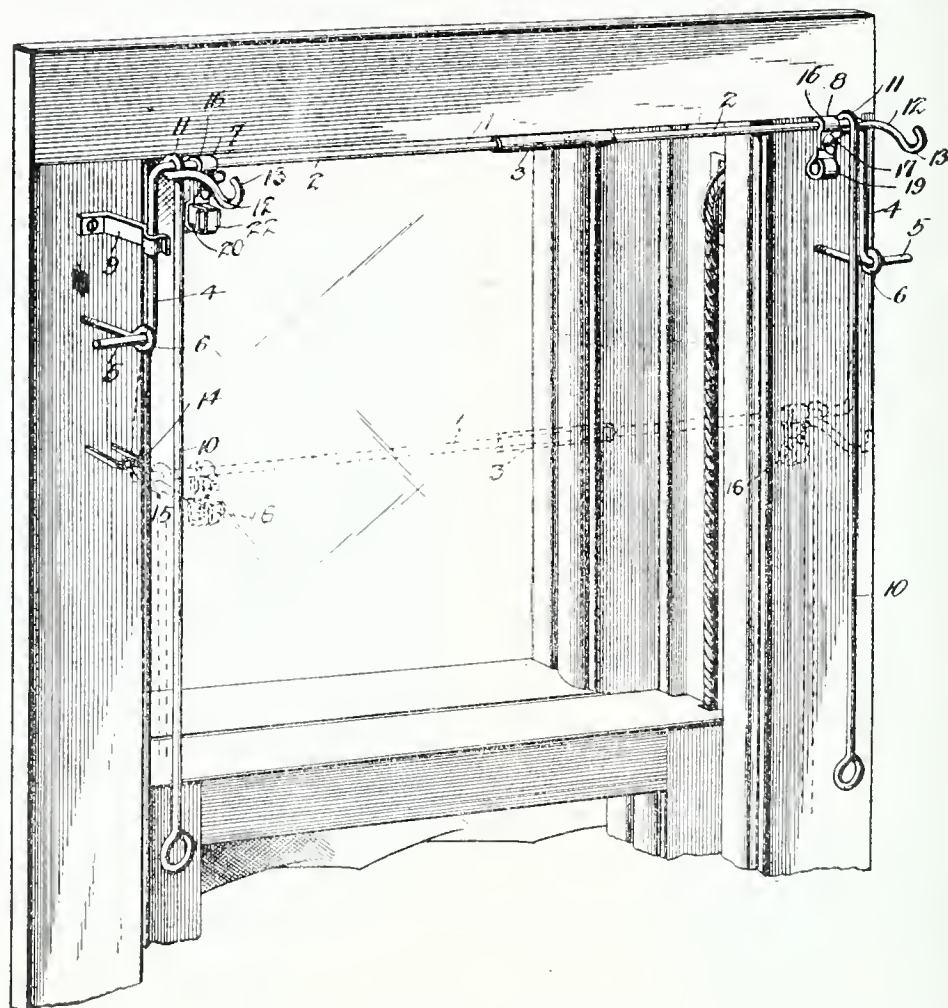


upon the cylinder is a steam chest 7 to which leads the supply pipe 13 and from this steam chest, ports 8 and 8a lead to the different compartments of the cylinder. An automatic sliding valve, operated by a cam arranged on the shaft, controls the supply of steam to the ports, so that the expansion of said steam is employed in driving the engine. When steam is admitted into one compartment, the cylinder will be revolved in one direction, and when passing through the other compartment the engine runs in a reverse direction. In order to control these movements, a hand operated valve 9 is located directly upon the automatic controlling valve, and is provided with ports which will align with the ports 8 or 8a so as to admit steam through either. This latter is actuated by a lever 17, carried by a rock shaft, which shaft is provided with a crank arm engaging the valve.

### Window Shade Hanger.

A window shade hanger of unusual merit has been devised and patented by Mr. James B. Merkel, of Hattiesburg, Mississippi. By an ingenious arrangement, the window shade hanger is adapted to be readily operated to raise and lower the curtain pole and window shade to arrange the same within easy reach, whereby the curtains, drapery, or the like, may be removed, replaced, adjusted and draped without climbing upon a step ladder, chair, or the like, to effect such result.

Referring to the illustration, 1 designates a supporting frame composed of two rods 2 and a central tubular section 3 receiving the adjacent ends of the rods, and adapted to permit the frame to be adjusted laterally to vary its width to suit the size of the window. The rods are provided at their outer ends with arms 4 terminating in pivots or pintles, which are arranged in suitable bearings 6, whereby the frame is adapted to swing from the position illustrated



in full lines in the figure to that shown in dotted lines. The frame is held in a raised position by a catch 9, constructed of resilient material, and adapted to permit the frame to be readily swung into and out of engagement with it when the necessary force is applied. The swinging of the supporting frame is effected by means of rods 10, which are provided with loops or hooks to receive the curtain pole. A curtain shade is suspended from the supporting frame by means of brackets 8 hung from the frame and adapted to maintain an upright position at all times.

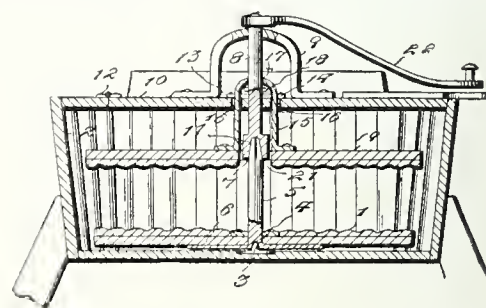
When it is desired to lower the supporting frame, it is only necessary to grasp the rods 10 and pull downwardly on them. This will swing the supporting frame out of engagement with the catch 9, and will bring the brackets and the pole-supporting arms within easy reach. A window shade, curtain pole and lace curtains or the like may then be readily applied to the hanger and draped or otherwise arranged as desired. When the window shade and the draperies have been properly adjusted and arranged, the supporting frame may be swung upwardly to the position illustrated in full lines in the cut without disarranging the curtains or draperies.

### Washing Machine.

Andrew G. Brandt, of Scranton, and David L. Griffiths, of Olyphant, Pa., have patented a washing machine, and Andrew G. Brandt has assigned his interest therein to David L. Griffiths. The washing machine, which is novel and ingenious, is adapted to be easily operated and is capable of rapidly and thoroughly washing clothes and various other fabrics without wearing, tearing, or otherwise injuring them. Referring to the illustration, 1 designates a lower oscillatory rubber consisting of a horizontal disk having an upper rubber surface and arranged within a tub 2. The lower rubber is provided with a central vertical stem or shaft 5, which is tapered and squared at its upper end to fit into a shaft 8, and the latter is journaled in a bracket 9 of the cover 10 of the tub, and is adapted to be oscillated or reversely rotated to operate the lower rubber. The upper shaft receives a yoke 15, which is secured to an upper rubber 19. The upper rubber, which is held against rotation, is capable of vertical movement to adjust itself automatically to the quantity of clothes being washed, and is

adapted to hold the same against the lower oscillatory rubber. As the clothes are carried around by the movement of the lower rubber, they will be operated on by both rubbers, whereby a thorough and rapid washing of the clothes is effected.

The cover of the tub is hinged, and the upper rubber and the upper shaft are mounted on the cover, and when



the latter is swung upwardly to open the washing machine the upper rubber is lifted out of the tub, and free access to the interior of the washing machine is afforded. The clothes may be readily placed in and removed from the tub, and they are quickly washed by simply swinging the handle 22 backward and forward.



## WATER SUPPLY IN THE COUNTRY.

HOW ONE MAN OBTAINED IT.

By. B. G. FOSTER.

If persons living in the country only realized how much natural power there is continually running to waste through their woods and meadows and how easily it can be turned to account, there is no doubt that much unnecessary labor and expense could be saved, as well as many luxuries obtained. A farm, in these days, is hardly considered by a buyer unless it has a stream through it, yet the purchaser has in mind only the use of such stream for watering stock, or perhaps its value for irrigating purposes in the valley or bottom through which it flows. There is, however, mechanical power involved, which is ordinarily never considered, and usually such power can be transformed to useful ends at little cost and trouble.

The accompanying illustration affords an example of such transformation. Mr. George N. Saegmuller,

In the end, however, the problem was easily and cheaply solved. A quarter of a mile from the tower runs an insignificant stream, which would hardly cover the back of a two-inch minnow and float it. The uninitiated would never conceive of power in connection with it. A spring is located beside the stream. Mr. Saegmuller conceived the idea of utilizing the force of this stream for pumping water to his tower. He therefore built the overshot wheel shown in the picture, dammed the stream a hundred yards above the wheel and conducted the water to a reservoir or tank located thereabove, by a shallow flume or trough supported on a line of posts. The water passes from the reservoir through a valved opening in the lower end thereof, and is projected with considerable force into the buckets of the wheel, thus turning the same. A triple cylinder pump is lo-



the owner of a large stock and dairy farm situated ten miles from Washington, D. C., in Alexandria County, Virginia, appreciating the necessity and desirability of an ample water supply for farm purposes and household needs, constructed a large stone water tower surmounted by a tank having a capacity of 30,000 gallons, his intention being to force water thereto from a spring situated three or four hundred yards from the tower and at the bottom of the hill on which it stands. Here difficulty was encountered. Several styles of rams were tried, but as the flow obtained therefrom was small and they required constant attention, they were discarded for an explosive engine. This also required watching, the cost of operation was considerable and, like many modern laborers, it very often went on a strike for apparently frivolous reasons. Finally a windmill was built, but was unsatisfactory especially in summer time, when most needed, because of the fickleness and want of winds.

cated in the wheel pit and is operated from the wheel by a chain and sprocket connection with the axle. The water is piped to the pump from the spring and thence to the tower. As a result, a flow of 7,200 gallons per day of pure spring water is obtained at the tower, over quarter of a mile away and at a very considerable elevation, a supply more than sufficient for every purpose, without the necessity of water meters in the houses of the tenants and employees for eliminating the waste. Moreover, the full efficiency of the stream is by no means utilized, and if necessary the supply can be easily doubled.

Thus, this gentleman has, by an old-fashioned but reliable servant, obtained a copious supply of water which, outside of the expense of installation and occasional lubrication, costs practically nothing, the whole mechanism being of the simplest character so that there is nothing to become deranged. How easily this can be duplicated on thousands of farms throughout the country!

## IMPORTANT COURT DECISIONS.

DECISIONS OF THE U. S. COURTS.

Court of Appeals of the District of Columbia.

IN RE WAGNER.

Decided June 25, 1903.

PROCESS—PATENTABILITY—NOT ANTICIPATED.

A process of pasteurizing beer which consists in continuously moving the bottles through the pasteurizing agent *Held* not anticipated by a process in which the pasteurizing agent is continuously moved in reference to the stationary bottles of beer.

## COMMISSIONER'S DECISIONS.

EX PARTE STARKEY.

Decided November 8, 1902.

1. REISSUE APPLICATION—BROADENING THE CLAIMS—DELAY OF NEARLY SIX YEARS IN FILING—LACHES—REJECTION.

Where a reissue application is filed for the sole purpose of broadening the claims of the patent and the patentee delays filing his reissue application for a period of nearly six years from the date of the grant of his patent and no reasonable excuse is offered, *Held* that the applicant is guilty of laches in making application for his reissue application, and the application for the reissue should be rejected for that reason.

2. SAME—ERROR IN PATENT APPARATUS ON INSPECTION—DELAY OF SIX YEARS UNREASONABLE.

Where it is apparent upon inspection that the claims of the original patent are narrow and based upon the exact structure illustrated and described, and it appears that the patent has been under constant scrutiny by parties interested since the date of its issue, and it does not appear that the device manufactured under the patent different in any respect from the device illustrated, described, and claimed, *Held* that a delay of six years in applying for a reissue of the patent to broaden the claims is unreasonable.

3. SAME—ELIMINATION OF ELEMENT IN CLAIM—NOT INADVERTENCE OR MISTAKE—DIFFERENT INVENTION.

Where the purpose of the reissue is to eliminate from the claims of the original patent an element which had been specifically claimed therein without the substitution therefor of an

equivalent and the effect of this is to expand the original patent. *Held* that the failure to claim the particular combination not claimed in the original patent, but claimed in the reissue, was not due to any such inadvertence or mistake as would authorize claiming it in a reissue and that the reissue was not for the same invention as the original patent.

## Wave Power.

Although it has been shown again and again that it is impracticable to make use of the power of waves even under the best conditions, from time to time schemes for doing this crop up. No objection can be raised if an inventor spends his time in attempting to solve the wave motor problem, but it is very desirable that those who are asked to invest money in such schemes should know what has been done and the conclusions that have been reached by well-known engineers after careful examination of the project.

The latest scheme which has come to our notice is that of a Pennsylvania inventor. His plan is announced very indefinitely in the daily press. "The invention is to run five hundred feet into the water, shore connections being made by a system of cogs and shafting. One man can operate the entire apparatus from the generator to the dynamos. The power to be obtained is governed only by the size of the apparatus."

There is very little difficulty in constructing a motor which will be operated by waves and will deliver power—indeed, this has been done on the Pacific coast, but to construct an apparatus which will develop power in any quantity, necessitates a large investment which could be employed more profitably in other ways, and besides there is a factor of uncertainty involved which would be fatal for all but minor applications—*Electrical Review*.

To keep themselves posted in the progress of the art in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitles it to the support of all the inventors of the country.

## PATENTS

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-THREE YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

## INVENTIVE AGE

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

E. G. SIGGERS, 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been recently procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Anderson Little, Inventor, Riverside, Ala.: Walter S. Crump, Seddon, Ala., assignee one-half interest. **Metallic Broom.**—This structure is intended for rough and heavy work and can be manufactured at very small cost. A head is provided which tapers towards its upper end and has a handle. To the lower portion of the head are secured metallic sheets cut lengthwise into narrow strips to form bristles, these bristles being preferably twisted to make them resilient in all directions. The bristles thus formed may be sewed with wire if desired.

George W. Harris, Perry, Oklahoma Territory. **Kitchen Cabinet.**—This is a very useful article of household furniture, and comprises a body subdivided into a number of compartments and drawers to contain the usual kitchen utensils, condiments, and the like. One end of the body comprises a flour receptacle, and located in this end is a partition that tapers toward its lower end and is adjustable, this partition constituting a support for the dough while being raised. Duplicate covers are employed, which can be so arranged that the cabinet can be employed as a table.

Claude D. Seaman, Inventor, Topeka, Kansas.: C. C. Gardiner, Bradford, Kansas, Assignee. **Electric Railway Signal.**—The signal apparatus disclosed in Mr. Seaman's patent is notable for its extreme simplicity and inexpensive installation. It merely embodies a two-battery circuit, a single relay, an alarm or signal device, and a signal circuit controlled by the relay. The relay is so constructed that with this simple combination of elements, an alarm is sounded at a crossing upon the approach of a train, is automatically terminated as soon as the train has passed the crossing, and is resounded upon the backing of a train toward or across the crossing, or upon the approach of a second train before the first train had passed beyond the signal block or the outgoing track section thereof. By reason of this novel arrangement, the single relay performs all of the functions of the usual relay sets which include a plurality of relays and complementary wires. Provision is made for the adjustment of the device to accommodate various conditions of use, as, for instance, the length of the track sections, the strength of the batteries, etc. The control of the signal circuit is effected by a contact of the sliding type, for the operation of which the force of gravity is utilized to a considerable extent. A maximum torque of the relay armature is obtained, and the entire device is protected from injury by moisture or insects.

Fred W. Billings, Clarkston, Wash. **Grain Threshing Machine.**—This invention embraces, among other features, novel means for handling the straw whereby there is no period in the operation of the machine during which the straw is held back or retained. It also includes means for subjecting the grain to a primary cleaning, whereby the chaff is eliminated therefrom before the grain is delivered to the grain pan and main cleaning shoe of the machine, thus relieving the sieves of the chaff which ordinarily passes therethrough with the grain. Perhaps the most novel feature of the machine resides in the means for effecting a secondary separation for the purpose of saving such of the grain as is carried back through the machine with the straw. Within

an interval between a straw carrier and a chaff apron is located a bridge disposed to convey the straw from the straw carrier to the chaff apron at a point intermediate of the ends of the latter. A blower is arranged below the bridge to project a blast of air in a direction substantially parallel with the stream of straw passing over the bridge. By thus locating the blower, the blast therefrom will not interfere with the gravitation of the grain and chaff through the bridge, but will winnow the falling grain and deposit the chaff upon the chaff apron at a point below the bridge. The bridge is composed of opposite oscillatory sections, which break the advancing stream of straw in alternately opposite directions to permit the separation, and gravitation of the grain, chaff, etc., from the straw, and to permit the same to fall within the range of the blast from the blower.

Joseph J. Atkinson, New York City, N. Y. **Baling Press.** Three patents. Mr. Atkinson's patents disclose the result of much intelligent experiment with a development of cotton baling machinery. The compress shown in these patents is of that type designed to form a cylindrical bale by building up a column of the fibre by winding spirally endwise of the column a highly compressed fiber layer. It appears that years ago an attempt was made to produce a compress of this character embodying a baling chamber above which rotated a compressing head equipped with a series of radially disposed conical compressing rollers. The cotton was fed down between these rollers and initially compressed to form one or more layers, which were wound within the compressing chamber by the rotation of the head to form a column constituting a cylindrical bale. These early efforts, however, were unsuccessful because the press, while theoretically effective, proved in use to be entirely impracticable. Recognizing the value of the principle involved, however, Mr. Atkinson has addressed his attention to the perfection of this type of presses, and the novel features introduced by him and disclosed in his three patents under discussion, have not only contributed to the production of an efficient press, but it is believed that the press so produced marks a radical advance in this particular art.

The first patent contemplates an arrangement whereby the compression rollers instead of being rotated by reason of their frictional engagement with the upper end of the column of cotton, are positively rotated at a speed slightly greater than normal, so that the banking of the cotton in advance of the rollers, which was one of the greatest objections to the early construction, is absolutely prevented. It appeared, however, that this banking of the cotton and the consequent clogging of the compression head was not the only difficulty to be overcome. It was found in practice that the cotton in passing down between the rollers had a tendency to draw toward the center of the bale. This tendency was apparently due to the rotary movement imparted to the cotton at the top of the bend by the rotation of the pressing head and its rollers, and if permitted to continue resulted in the formation of a bale lacking that uniformity of density which is essential to the commercial value of bales of this character.

The second patent obtained by Mr. Atkinson therefore discloses an arrangement whereby this centripetal movement or indrawing of the fiber is prevented. To the accomplishment of this end, a compression member in the form of a ring is mounted in the compression head and is arranged to bear against the upper end of the bale at points intermediate of the rollers to oppose a resistance to the inward movement of the fiber. Having overcome this centripetal tendency of the fiber immediately below the compression head, it was observed by the

inventor that the uniform feeding of the cotton between the rollers from above the same, was prevented by the tendency of the cotton to move outwardly by reason of the centripetal force induced by the rotation of the head.

The third patent therefore presents means for overcoming this tendency of the body of cotton located above the rollers. To the attainment of the desired end, a feed guide or plate is located upon the compression rollers for the support of the body of loose cotton, and is formed with radial feed openings through which the cotton is fed between the rollers. This feed guide or plate is of dished or inverted conical form, and it is found in practice to be entirely effective to compel the uniform feed to the cotton press. In its present form the press appears to be all that could possibly be desired, and its commercial success seems to be assured.

Charles F. Wilson, Inventor; Vilroy Chesney, assignee, Bucyrus, Ohio. **Gas Burner.**—This invention is a burner for gas stoves of that type in which a fluid fuel, as for instance, natural or artificial gas is utilized by means of a novel and economical arrangement of parts, a proper mixture of gas and air to form a perfectly combustible vapor is accomplished, and the liberation of noxious gases or other products of combustion is prevented. The device comprises a receiving chamber closed at its upper side by a removable jet plate. Above this plate is supported a detachable tube plate spaced from the jet plate to form an intermediate mixing chamber and having a series of burner tubes, each of which is open at both ends and is coincident with one of the jet openings. Gas is liberated within the receiving chamber and is projected upwardly into the burner tube through the openings in the jet plate. This production of the gas in the form of small jets causes a proper amount of air to be drawn up into the tubes and mixed with the gas. The vapor thus formed is ignited at the upper ends of the tubes. This burner is obviously highly effective, and the simplicity of its construction, and the detachability of its parts enables it to be easily cleaned.

Omar P. Wagner, Pontiac, Illinois. **Fumigator.**—The present invention is primarily intended for fumigating fowls and destroying vermin thereon. A rectangular box is employed, one end of which is provided with sliding doors through which the fowls may be inserted. The top of the box has openings through which the heads may be passed, these openings being provided with flexible diaphragms and head-holding devices are slidably arranged thereover. Suspended from the box is a conical burner, the lower end of which has an opening through which the fumigant may be inserted, this opening being normally closed, however, by a sliding sleeve, constituting a door. In use, the fowls are placed in the box with their heads exposed through the openings. The doors are then closed and the fumigant ignited in the burner, whereupon the fumes will enter the box and thoroughly permeate the bodies of the birds without injuring the same.

Allen K. Johnson and Charles A. Rond, Jr., Norfolk and Portsmouth, Va., respectively. **Awning.**—This invention is an awning arranged to be mounted opposite a window and to be raised and lowered in the usual manner. The particularly novel feature is the peculiar mounting of the awning, which permits a free circulation of the air around its sides, and enables it to be swung laterally according to the position of the sun for the purpose of shielding the window from the sun's rays, and for the further purpose of deflecting the air into the room from any desired direction. Unlike ordinary awnings, the one described in this patent is capable of being folded

entirely above the top of the window, so that no obstruction is opposed thereby to either the light or air.

Frederick W. Richter, Chicago, Ill. **Floor and Side Walk Cleaner.**—This device combines in a single structure a shovel particularly designed for removing snow, a scraper disposed in rear of the shovel for breaking up or removing ice or densely packed snow, and a squeegee or drying device in rear of the scraper to dry and clean the floor or pavement, from which the ice, snow or other debris have been removed by the shovel and scraper. The shovel, scraper and squeegee are carried by a single handle, and so arranged that by a simple manipulation thereof, the squeegee may be employed alone, or in connection with either the shovel or the scraper, or with both of said elements, as desired.

Andrew T. Osborn, Malden, Mo. **Chimney Attachment.**—The invention covered by this patent is a device which may be employed as a stand for supporting small articles while being heated, being also combined with a cap which will permit a lamp to be carried out doors and in a draft. A wire frame is employed having depending spring legs which are adapted to be inserted in the chimney top. The legs have upper portions which are combined with a metallic connecting plate to constitute a stand for a cup or like receptacle to be used in heating water. A cap is adapted to be detachably fastened upon the frame when desired, and thus prevents drafts of air passing downwardly into the lamp.

Fred G. Irvine, Marietta, Ohio, and John B. Braden, Salem, W. Va. **Apparatus for Removing Drilling Tools from Wells.**—The invention relates to an apparatus for removing drilling tools from wells, the object being to provide thoroughly effective means to recover tools from wells, where they have become bound by the caving in of the walls of the well or from other causes.

A further object is to provide means to prevent the casing from dropping down over the tool, should the casing pull apart under the stress of the mechanism employed for raising it.

The invention consists of a wedge-shaped abutment having a seat for engagement with the top of a drill tool, a guide rising from the abutment, casing-engaging-means slidably mounted upon the guide and in cooperative relation with the wedge-shaped abutment to force said casing-engaging-means into engagement with the casing, lowering devices connected to the casing-engaging-means, and internally serrated tool-engaging wedges carried by the abutment, the tool-engaging-means and the well-casing-engaging-means being in such relation that the casing is alternately brought into operation by the reciprocatory movement of the casing.

This invention is being put in practical operation, and is meeting with commercial success.

John B. Braden, Salem, W. Va. **Rope Clamp.**—The invention relates to clamps for ropes, cables, and similar articles, and more especially to that class employed in drilling or cleaning oil and artesian wells. A one-half interest in the patent has been assigned to Fred G. Irvine, of Marietta, Ohio, and the clamp is being manufactured by the Leidecker Tool Company of that city. Briefly stated, the clamp consists of a body having a socket and guides secured to the body on opposite sides of the socket. A holding yoke is slidably mounted on the guides, and springs are interposed between the yoke and body to yieldingly support the yoke in spaced relation to the same. Slips pass through the yoke and engage in the socket of the body, these slips being separate from the yoke and having outstanding flanges that rest upon the same.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 730,694, dated June 9, 1903. The most practical washing machine ever produced; the product of forty years experience. I challenge the world on two minute work; grand opportunity for inventors. Address, O. E. Peterson, South Glen Falls, N. Y. nov

**FOR SALE**—Patent No. 724,953. Improved Fire Ladder; can be used as a fire escape, a water tower and an extinguisher. No reasonable offer refused. Address, John C. Schaller, Hastings-on-Hudson, N. Y. nov

**FOR SALE**—Patent No. 709,024, dated September 16, 1902. A valuable patent. An illuminated street car sign. Will sell state right, shop right, or on royalty. Also Canada patent for same to sell outright. For further particulars, address John Lorich, Jr. Williamsville, N. Y. nov

**FOR SALE**—Patent No. 735,251, dated August 4, 1903. Bolt Holding Implement. A useful tool for blacksmiths, wagon and carriage repairers; also for farmers for repairing farm machinery. Address, Julian R. Harrison Barnwell, S. C. nov

**FOR SALE**—A recently patented practical fence stay, to be used between posts on wire fences. Is light, durable, strong and cheap. Prefer to sell outright. Specifications, drawings and price furnished to interested parties on application. Address, Chas H. Senour, Dripping Springs, Texas, nov

**FOR SALE**—Patent No. 732,231, dated June 30, 1903. Postless Wire Fence and Telephone combined. This fence consists of endless cable stay. Inventor will warrant same to be durable and reliable. Address, M. H. Starling, Roxbury, Ohio. nov

**FOR SALE**—Patent No. 731,061, dated June 16, 1903. The automatic cattle proof mail box. Approved by Postmaster-General. The best rural box made. Address, C. F. Mackenzie, Shell, Wyo. nov

**FOR SALE**—Patent No. 721,425, dated Feb. 24, 1903. Adjustable support for fire arms, fishing poles, artists umbrellas, etc. Can be made to fit any gun or rod. For particulars, address R. N. Clyde, Shelter Island, N. Y. nov

**FOR SALE**—Patent No. 732,985. Schedule and Train Calculating Machine. United States right \$50,000. Address, J. M. Wilson, Jr., Graysville, Ga. (nov)

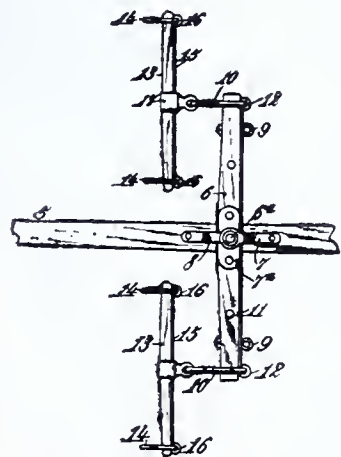
**FOR SALE**—Patent No. 733,871, dated July 14, 1903. Necktie. Contains special improvements in sewing and fastening. For price of entire right and plan of manufacture address, Otto Wm. Peterson, Bertrand, Nebr. (nov)

**FOR SALE**—Patent No. 734,360, dated July 21, 1903. Fastening for shoes with new improvement. For sale or on royalty. Address, F. Paschen, Tampa, Fla. nov

**FOR SALE**—Patent No. 719,170, dated Jan. 27, 1903. Folding Camp Chair. Possesses great advantages over other camp chairs. Address, Ely T. Zimmerman, Mansfield, Ohio. oct

## MAYO'S WHIFFLETREE.

D. L. MAYO, Mount Sylvan, Texas.



This invention relates to whiffletrees, and the object is to provide a device of this character especially adapted for attachment to farm implements. This whiffletree can be cheaply manufactured, is very strong and durable, and can be easily and quickly adjusted or regulated, as desired. Every farmer would recognize at a glance the great merits of this invention. It is certain to have a large demand. It is the most practical whiffletree ever invented.

**FOR SALE**—Patent No. 728,945, dated May 26, 1903. Ratchet Pipe Wrench. Any one may send in his offer for any state, county, or shop right, or the entire right. Highest bidder will secure the patent right. Address, Joseph Levy, Verdigris, Nebr. oct

**FOR SALE**—Patent No. 727,442, May 5, 1903. Hoisting device. Cheap in construction, double acting; for use inside or outside of buildings. Address, Michael Rath, Two Rivers, Wisconsin. oct

**FOR SALE**—Patent No. 708,736. Round Axle Ball-bearing Fixture for Shade Rollers, Carpet Sweepers, Awning Rollers, etc. For full particulars address, John Renner, 612-614 Jefferson St., Burlington, Iowa. oct

**FOR SALE**—Patent No. 726,752, dated April 28, 1903. Ship's Table. Always remains horizontal, no matter how the ship rolls or pitches. Address, William J. Preater, 224 Franklin Street, Elizabeth, N. J. oct

**FOR SALE**—Patent No. 726,610. Bicycle Canopy. Every bicycle made wants a canopy. Will sell outright or lease on royalty. For full description address, Martin Zech, Prairie du Sac, Wis. oct

**FOR SALE or on royalty**—Patent No. 731,922. Display Rack for lace curtains, bed spreads, etc. In cabinet form on casters; easy to move around; cabinet 20 inches deep; holds 42 hanger arms; can be made in any size. Also Canadian patent. Address, Lindquist & Agle, Argyle, Minn. oct

**FOR SALE**—Patent No. 727,204, dated May 5, 1903. Rogers Spectacle Holder. Will sell part or on royalty. Only device for carrying spectacles when not in use. Does away entirely with a clumsy case. Rare chance for some one. Address, A. W. Rogers, Fort Myers, Florida. oct

**FOR SALE**—Patent No. 721,532, dated Feb. 24, 1903. Sheet-music Cabinet. Makes it just as easy to handle 500 pieces as to handle five. For simplicity and convenience, has no equal. Address, C. P. Baron, Haymond, Franklin County, Indiana. oct

**FOR SALE**—Patent receptacle for molasses. Patented April 14, 1903. Can be manufactured at a good profit. Every housekeeper will have one. Send for drawings, free. Address, G. R. Turner, 19 Sewall Street, Augusta, Maine. (sep)

**FOR SALE**—Patent No. 726,809. Car Seal, dated April 28, 1903. Very simple and practical. A first-class patent. Terms \$6,000 cash. Address, Thomas White 139 West 27th Street, Ogden, Utah. (sep)

**FOR SALE**—Patent rights for building construction. Can be secured for single territories at cheap rates from the patentee. Address, H. Maring, Architect, No. 103 East 125th Street, New York, N. Y. (sep)

**FOR SALE**—One-half interest or the entire patent of a good practical machine for use in tin shops. Address, A. B. Hill, 634 18th St., Denver, Col. (sep)

**FOR SALE**—Patent No. 726,668. Wire Stretcher. Will sell outright. For particulars address, Charles J. Fox, Leavenworth, Kansas. (sep)

**FOR SALE or manufacture on royalty**—A patented pin for securing a belt. A new idea; not a buckle. Address, M. M. McGrath, 150 Maplewood Ave., Germantown, Philadelphia, Pa. (sep)

**FOR SALE**—Patent No. 725,956. Improved Railroad Switch. Prevents all wrecks from open switches; practical, simple, inexpensive to manufacture. Price \$10,000. Address, E. L. Alderman, 445 High Street, Holyoke, Mass. (sep)

**FOR SALE**—Patent No. 652,655. Improved Trace Fastener. A splendid invention. Address, W. G. Lee Woods, San Antonio, Tex. (sep)

**FOR SALE**—Patent No. 703,118. Draft Rigging for Railroad Cars. Address, Wm. H. Cox, Iron Mountain, Michigan. (sep)

**FOR SALE**—Patent No. 723,020. Grain Shocker. Address, Amil F. Ponath, Greatbend, N. D. (sep)

## WANTED.

**WANTED**—Agents to sell state and county rights for my wire reel apparatus. Patent No. 726,855, dated May 5, 1903. Address, Jesse W. Brooks, Churchhill, Texas. oct

**WANTED**—A partner with capital to promote patent, manufacture and sell the same. Invention is a Rotary Engine of a new type. For particulars address, J. B. Pollard, Box 343, Roanoke, Va.

**WANTED** to have manufactured, or will sell on royalty plan. Patent No. 733,840, dated July 14, 1903. Heating device (cooking drum,) the best thing now in use. Saves time, labor and wood. Nothing so cheap and convenient. Cooks to perfection. Write for particulars. J. W. Howell, 804 East F street, Hillsboro, Texas. (nov)

## YOU SHOULD SUBSCRIBE FOR THE ARMY AND NAVY MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

### A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. The **ARMY AND NAVY MAGAZINE**, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00

## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America.

For rates, address—

**The Railway and Engineering Review**, 1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,

Send for sample copies. ALLENTOWN, PA.

## SELF-EDUCATION FOR MECHANICS.

A Monthly Journal intended as a Guide to Correct Methods in Work and Study.

25c. A YEAR. SAMPLE COPY FREE

Industrial Publication Co.,

16 Thomas Street, - - NEW YORK.

## ...SILK...

A JOURNAL PUBLISHED MONTHLY.

Devoted exclusively to the Raising of SILK and the Manufacture of the same. Only one dollar (\$1.00) a year.

Subscribe now. It contains information you ought to know.

Address,

**SILK PUBLISHING COMPANY.**

Tallulah Falls, Georgia.

Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING Co., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

## "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O.....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

## BOYS Get a Good Stem Winding Watch FREE

You get 10 subscribers to a \$1.00 paper for 6 months at only 20 cts. each. You send us the 10 names and addresses and \$2.00 and get the watch. Perfect time guaranteed for 1 year. Full outfit free.

Address,

**AMERICAN HORSE-POWER.**

315 Dearborn Street, Chicago.

**E. C. WILEY,**  
Mechanical . . .  
Engineer,

Office 811-1-2 Main Street,

Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

**FRED. B. NICHOLS & CO.,**

913 E. St., N. W.,

Wholesale Stationers, Washington, D. C.





# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,

WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, SEPTEMBER, 1903.

### Copies of Patents.

This paper has heretofore called attention to the difficulty of obtaining copies of patents. For some reason a rule has been promulgated that no more than ten copies of a patent will be furnished on a single order, and it is a matter of everyday occurrence that information is conveyed to those ordering copies that copies of such-and-such patents are exhausted. An attorney never orders a copy of patent unless it is deemed necessary to his interests; and it seems strange that he should be required to give his reasons for ordering a copy of any particular patent, and yet such is a fact, for when a copy is found to be exhausted the applicant for the copy is informed that the patent will be reprinted only upon furnishing special reasons. It is bad enough to have to delay business on account of not being able to obtain the copy; but it adds to the disagreeable nature of the situation to be advised that the copy will only be reprinted upon giving reasons for ordering the same.

It is frequently the case that preliminary reports as to patentability are delayed because they cannot be accompanied by copies of conflicting patents. Not only that, but the prosecution of applications is held up for similar reasons.

It is probably true that the reprinting of patents involves considerable expense to the Government, more so than the money received for each individual copy; but this fact should not have any weight, and certainly should not prevent an applicant from receiving a copy of a patent when he wants it. The Patent Office should try to accommodate the inventors and their recognized agents, and give them proper return for the money which they pay in to maintain the Office.

It would seem to the AGE that proper and earnest representation before Congress would induce the legislative body to be more liberal in its treatment of the Patent Office, and to give a larger appropriation for the reprinting of copies of patents. Certainly something is due to the inventors, whose interests should not be allowed to suffer any longer by the failure to obtain promptly copies of patents when ordered.

### Modern Skilled Labor.

The day of handicraft as the dominant factor in the world's work has gone, irrevocably replaced by the age of organization, of centralization, of automatic machinery; and the workman must find his place under the new regime as he found it under the old. There have been innumerable gospels of sentimental nonsense preached over the ideals and inspirations of the mediæval workman. We instinctively think of artists like Cellini, happily forgetful of the countless hordes of knaves and bunglers who, in lack of wit to dodge the hangman, have unwillingly wrought with clumsy hands abominations which have eumbered oblivion since the days of Tubal Cain and Hiram of Tyre.

Likewise there is vast twaddle of the happy golden age of the working man some centuries ago, and solemn computation of day's wages reckoned in beef and barley. The hopes and aspirations of the workman of the present time are not yet circumscribed by his stomach, and his daily life is crowded with comforts and conveniences which the world had never known in the days of his hard-working forefathers.

The workman of to-day has gained immensely in power of gross accomplishment, but he runs great risk of losing much in power of initiative that his gains will avail him little in the struggle of existence. Yesterday he learned a trade; today it is the undivided tenth part of a trade that stands between the man and want.

The twentieth century conception of a machine shop, for instance, is not an aggregation of intelligent workmen, provided with the most efficient tools and apparatus that ingenuity can devise and using them with all the cunning that trained minds can suggest. The shop from the present standpoint is simply a huge machine tool, as void of conscious volition as an automatic screw machine, of which the intelligent operator is the manager and in which lathes and workmen, drills and inspectors, milling machines and laborers, are on one common plane of non-sentiment, co-acting subordination. It is no longer the artisan's business to see that his work is the best that he knows how to do, but merely that it is close enough to gauge to pass the inspector and go on unchallenged to the next stage and the next semi-automatic workman. Human hands are used instead of steel fingers merely where they are the cheaper means for putting a block of material through a given series of more or less complicated motions, and perfection is reached when the one becomes as deft and unconscious as the other.

The man who feeds blanks into a punching press has no craftsman's pride in his work. If things go wrong, he blames the die maker much as a heated bearing, if it could do more than squeak, might blame the oil-eup that failed to lubricate it in time. And when the feed man loses his job, he is about as capable of independent action as the discarded oil-eup would be. In other words with the increased general efficiency that comes with organization, comes also decrease in personal responsibility and initiative. This is the paramount danger in modern organized industry.—*Cassier's Magazine.*

### New Cure for Cancer.

At the clinic of Prof. Dr. Ernst von Leyden, of the faculty of the Friedrich-Wilhelm University in Berlin, there are now in progress tests with a preparation for the treatment of persons afflicted with cancerous disease. The preparation was invented by Dr. Julius Gnezda, a scientist who has made various contributions to physiological chemistry, and who read, among other papers, a thesis at the International Medical Congress, held at Washington in 1887, on the subject of cobra poison.

The facts which led Dr. Gnezda to prepare the substance in question were:

1. The beneficial effect of Fowler's solution on patients with cancer of the stomach, already observed and recorded by other physicians.
2. The retention of chlorine in the tissues of said patients.
3. The good results which Dr. Gnezda obtained when he treated patients with albuminous matter that contained phosphorus in an organically combined form.

Consequently, Dr. Gnezda went on to prepare a compound which contained the underlying principles of the therapeutical actions described, the process of the manufacture being substantially given in the application for the patent. The preparation which is being tested at present is made from the white of egg—200 grams of white of egg were treated with 40 grams of phosphoric acid anhydride in successive portions. The product was allowed to stand until cool, and there was then added 20 grams of trichloride of arsenic under digestion. After the addition of water, the precipitate was washed with alcohol, dried and pulverized.

The powder called "akarkine" (from the Greek *Alpha privatium*, not or against, and *karkinos*, cancer) is insoluble in water and weak mineral acids, but is soluble in alkalis. What is more important, akarkine is acted upon by the pancreatic juice and readily digested by it.

The chemical analysis of akarkine shows a proportion of 4.23 milligrams of arsenic in 1 gram, a fact which tends to prove that one atom of arsenic entered one molecule of albumin, the molecular weight of albumin generally being considered as 14,000 to 15,000.

Akarkine is administered in the clinic of Professor Leyden at the beginning in doses of half a gram three times a day before meals. The doses are increased successively to 4 grams a day and more. No untoward effects were observed, and especially no rising of the temperature, irritation of the stomach, or weakening of the heart action.

In special regard to persons with cancer of the stomach, it has been observed that vomiting ceased and that the pains in the abdomen disappeared.

On the question whether and how far akarkine is likely to have a direct local influence on the cancerous growth itself as far as concerns the living growth, Dr. Gnezda does not wish to declare definitely at present, but experiments on growths taken from post-mortems have shown that there actually existed an interaction between the constituents of the growth and akarkine.

### A NEW DANISH INDUSTRY.

#### Imitation of Marble.

The absence in Denmark of marble, a material highly decorative and useful for so many various purposes, has naturally excited a desire, through imitation, to make a substitute that could replace it, and which, as regards cost of manufacture, would not exceed the original cost of natural marble at the shipping places. What especially constitutes the great utility of marble in the building trade and for various purposes of decoration, is the effect obtained by the variety of tints and shades of color in the different sorts of marble.

It is well known that colored marble, the yellow, red and green species are the most expensive; and it was but a matter of course that attempts at imitation were made in this direction, where as a consequence of the high prices, the most favorable conditions for a successful competition were at hand.

The invention therefore, that has been made by Mr. Soren Schougaard, a master builder, and native of Denmark, must be considered as a significant advance in this industry, a progress which will be of no small importance to the many branches of the building trade. Mr. Schougaard has succeeded in producing an artificial marble, to which no technical embarrassments are attached, and which, as regards delicacy of transition of tints and play of color, it is impossible to distinguish from real marble; and, moreover, as to cost of manufacture, is fully able to compete with all kinds of hitherto known artificial marble. The invention has also the advantage that the cost of imitating the most expensive species does not exceed that of the cheaper ones. The Danish invention is a patented secret of manufacture. The inconvenience hitherto experienced in imitating marble viz., that the whole mass had to be greased, in order to avoid adhesion whereby the crystalline surface of genuine marble disappeared—has been overcome. According to the inventor the *modus operandi* is simple and easy to learn; the cost of plant and tools for the purpose does not exceed \$175.

It would be difficult, now already, to predict to how many and various purposes this new invention may be applicable. It may be used for lining walls everywhere inside buildings, stairways, gateways, restaurants, &c. As it may be produced in any profile desirable, it is also practicable for columns, pillars, plain as well as fluted, for capitals, pedestals, &c.

Besides the building trade in particular, the cabinet making industry promises a great future for this new material, as also the manufacture of fancy-goods and articles of luxury, card tables, dressing tables, washstands, mantelpieces, shop-counters, butchers' window-slabs &c. may be made of it and possessing the same elegant appearance and durability as genuine marble, and for about one tenth of the cost of the latter. Finally, footpieces of lamps and candlesticks, inkstands, as also heraldic ornaments may be made of it, it being possible to introduce the various colors in the most intricate designs and patterns. Thanks to the certainty with which the mixing of the shades takes place, even pictures may be composed of this otherwise so difficult and unmanageable substance.

At the present stage of development of the manufacture, the inventor is in position to produce a slab of any kind of marble about  $\frac{1}{4}$  inch thick at an initial cost of about 15 cents per square foot.

A collection of samples is on view at the office of D. M. Fredericks, Room 816 Tribune Building, Chicago.



## SCIENTIFIC



## PROGRESS.

**Gold From Cyanid Solutions.**

A new and economical process for the recovery of gold from cyanid solutions, and which promises to supersede the methods now so extensively used in the gold mines of the Transvaal, and now becoming more popular in the mining districts of the United States, has been patented by Gustavus A. Bahn, of Austin, Texas.

By the methods now in use, the gold is extracted from the tailings or by a cyanid solution, which after dissolving the gold, is passed over zinc, which precipitates the precious metals to an extent. Whenever the ore contains copper however, the process is unsatisfactory, and at best, never separates all the precious metals from the solution. The inventor of the new process, adds sulphuric acid to the cyanid solution containing the precious metals, then, by immersing zinc, creates an electric action, which precipitates every atom of the precious metals contained in solution. While this process is going on, all of the cyanid of potassium that has been used in the solution recovers itself, and a fresh cyanid solution is at hand ready for use, at a fraction of the cost of the cyanid first used.

**Packing for Hot Rivet Joints.**

New packing material for hot rivet joints has been patented in this country by Mr. Leopold Lakeberg, a German coppersmith, residing in Lehe, Germany.

It consists of a sheet of pasteboard, to both surfaces of which wire nettings are fixed in any suitable manner. The wire-nettings are either pressed into the ready pasteboard, or they can be connected with the pasteboard while being manufactured. The wire-nettings on both sides of the pasteboard are filled with lac or varnish, which is of such a kind that it becomes liquid when very strongly heated—for example, to several hundred degrees—and hardens quickly and strongly at the usual temperature.

The packing is used in the following manner: Before the joint is riveted, the packing material is placed between the metal parts which are to be jointed. The rivet-holes are eventually to be made in the packing material before it is placed in position. When the red-hot clench-bolt is inserted, the lac or varnish which fills the wire-netting becomes liquid immediately around the riveting-hole and up to a certain distance around the same, and under the pressure with which the metal parts are pressed together by the rivet, the liquid lac flows into the small spaces which are nearly always left around the rivet, as the riveting-holes of the two parts are very rarely placed exactly over each other, the clench-bolt consequently deviating from its vertical position. The lac hardens simultaneously with the clench-bolt and the surrounding metal, thus forming a hard mass tightly filling out any holes or free spaces in the rivet, preventing the passage of cold water, even if the same is under a certain pressure.

**Compound for Abrading Tools.**

A Japanese residing in San Francisco, California, Keizo Sakurai, has recently obtained a patent on a compound for abrading tools.

This invention relates to the production of an artificial compound for use as a substitute for emery, carborundum, and the like in the manufacture of grinding-wheels and other abrading or polishing tools. Its object is to provide an abrasive compound possessing the following qualities: one which will have great hardness and durability and which will not suffer deterioration through the generation of heat by friction, which will be homogeneous throughout and will not become worn unevenly, which will have an enhanced cutting power and which will not be liable to glaze or to have the pores clogged by the dust from the article being operated upon.

In practice either granulated emery or a suitable silicate as garnet or quartz or granite of a uniform grade of fineness is taken, and a certain proportion of minimum of red lead is added thereto and moistened with a solution of silicate of soda or of potassium commonly known as "water-glass," to form a paste. Under some conditions a small quantity of finely powdered quartz may be profitably added, and under certain conditions from one-half to one per cent of borax, niter, or sassolin may be incorporated in the mixture. The powdered quartz is employed in conjunction with emery as a vitrifiable binder. The use of borax, niter, or sassolin gives homogeneity to the mass in firing.

**Range-Finder.**

An electrical range-finder has been patented by Harry Shoemaker, of Philadelphia, Pa., who has assigned one-half to Marie V. Gehring, also of Philadelphia, Pa.

The invention relates to a system for determining the relative position of an object—as, for example, the position of a vessel with respect to fortifications. The object of the invention is to indicate at any point or station the relative position of a distant object, so that an operator or gunner at such point or station may, without observations of his own, properly direct and control his apparatus. The system and the apparatus therefor constitute a range-finder, whereby a gunner may be constantly advised of the relative position of the object upon which he is to train his gun, though such object may not be visible to him.

In the system two indicators are independently controlled by as many independent sighting instruments, and it is upon the resultant indications of these two indicators that the gunner depends for his information. Each sighting instrument controls its indicator by electrical means, and these indicators co-operate to indicate the point upon a chart, such point signifying to the gunner that the object at which he is to fire is located in the same relative position as this point on the chart. The sighting instruments comprise telescopes rotatable in a horizontal plane about a vertical

axis, and means operated by the motion of such telescope to vary a characteristic of an electric current. The electric current in the circuit of the instrument controlled by the telescope has a different characteristic or is of a different magnitude for each angular position of the telescope. Each indicating instrument is, in fact, a Deprez d'Arsonval galvanometer consisting, as is well known, of a permanent magnetic field in which is mounted for movement about its axis a coil connected in the circuit controlled by the sighting instrument. Attached to the movable coil is a long slender needle or pointer, which by the system will always be at the same angle with respect to some reference line as between the longitudinal axis of the telescope and a corresponding reference-line. In other words, the needle or pointer of the indicator follows accurately and smoothly every movement of the telescope of the sighting instrument.

Two sighting instruments and two indicators are employed. Each sighting instrument is trained upon the distant ship or object, and this results in the indicating pointers or needles following the movements of their respective controlling-telescope, and the point of intersection of the needles or pointers corresponding with the location of the distant ship or object.

**Compound for Steel Making.**

Mr. William A. Givens, of Pittsburgh, Penn., has discovered a compound for use in steel-making.

The invention relates to improvements in processes and substances used in connection therewith in working steel, and has for its object the facilitating of welding, closely uniting or concentrating the molecules of atoms comprising cast ingots, without the usual difficulties experienced and expense encountered.

The novel process does not differ from that ordinarily employed until after the cast is made. Then as soon as the ingots shall have set, they are removed from the mold and buried in a pit containing the following compound, made in practically these proportions: common salt, forty-four pounds; borax, forty-four pounds; charcoal, twelve pounds; all of which are finely pulverized and intimately mixed. It is to be understood that the ingots so treated are taken from the mold as soon as their condition will permit, and hence are at high temperature at the time of their being enveloped in this mixture, and that they are allowed to remain therein until they have become cool. The steel ingots so treated do not require the hammer-welding process before rolling, the minute cracks and air globules not appearing as they invariably do in the untreated ingots.

**Compound for Metal Castings.**

A new composition for use in producing metal castings has been patented by Mr. Calvin W. Link, of Jersey City, New Jersey. The invention consists in commingling a silica such as shore sand, a vegetable oil such as corn oil, and a hydrocarbon oil such as petroleum, the vegetable oil predominating over the hydrocarbon; and its object is to provide a composition for the construction of

molds, cores and the like which shall be adapted to obviate the so-called "blowing" of the metal during the process of casting, which shall embody inexpensive and readily obtainable ingredients, and which shall possess advantages over prior analogous compositions.

Where the composition is employed in the production of cores and the like in the process of casting, the iron lies free from the core, no appreciable blowing effect takes place, the generated gases readily escape, and the proportion of mixture to the sand employed is much less than ordinarily required where other mixtures are availed of.

**Compound for Retorts.**

A new composition for protecting the walls of retorts and the like has been invented by Thomas J. Carlton, of Iola, Kansas. The composition consists of the following ingredients, combined in the proportions stated, viz: water, substantially pure, fifteen gallons; cobalt, twenty-five ounces; black lead, (graphite) twenty-five pounds; burnt powder of fireclay, ten pounds; saltpetre, (potassium nitrate) one pound. These ingredients are to be thoroughly mingled by agitation.

In using the above named composition, the retorts of earthen vessels should be thoroughly coated both inside and out with the composition about four hours before being placed in the kiln, where the retort or vessel is heated or hardened.

By the use of the above composition the coating on the outside of the retort protects the retort from iron, zinc, or other metals which may drip or percolate through the furnace, thereby acting as or serving the purpose of a retort fender or protector, also the coating on the inside of the retort prevents the metal, which is being melted in the retort, from being absorbed into the walls of the same, thereby acting as or serving the purpose of a retort metal-saver.

**Testing a New Brake in Germany.**

A meeting of the commission composed of representatives of the Imperial, Prussian, Bavarian, Saxon, and Baden state railroads was held at Karlsruhe on July 9, 1903, in order to test a new brake, which is known as the Steiner distance brake.

This new invention may be said to be an improvement upon the air brakes now in use. It is so connected with the air brakes of a train that, when the front wheels of a locomotive pass over a danger or halt signal placed upon the tracks, it will automatically put on the brakes, at the same time opening the whistle valve.

The apparatus worked with perfect satisfaction, even at the great speed of 83.75 miles an hour, but because of the extraordinary strain to which it was subjected, an important part thereof was broken.

The commission has recommended that an extended trial be given to the Steiner brakes upon the regular train service.

THE INVENTIVE AGE contains sound advice to Inventors and Patentees. For lack of such advice many have lost money. Subscription, One Dollar a Year.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued July 28, 1903.

### MECHANICAL PATENTS.

Continued from August number.

Electric motor controlling means... R. Lundell  
Elevator indicating mechanism... F. S. Payne  
Elevators, stairways, &c. Casing or housing for... J. J. Plucker  
Engine igniter. Explosive... W. H. Jones  
Engines. Electric igniter for explosion... G. A. Goodson  
Engines. Electric igniter for explosive... G. A. Goodson  
Engraving or carving machine... H. M. Albee  
Extension table... G. R. Roughley  
Extension table... L. Welker, Sr  
Eyeglass guard... W. E. Cawood, Sr  
Eyeglasses... W. C. Newman  
Fabric pin... G. W. McGill  
Fan or blower. Centrifugal... J. Verner  
Fanning mill... 2 pats... W. Sperry  
Fastener. Metal... A. Raper  
Fat separating machine... P. Feiten  
Feed table. Universal... H. P. Elwell  
Feed trough. Animal... F. H. Hayes  
Fence brace... E. G. Horne  
Fence post... S. Fielder  
Fence wire ratchet or tightener... C. A. Willmarth et al  
Fiber from leaves. Machine for extracting... A. Parres  
Fifth wheel... H. C. Swan  
Filter... E. M. Knight  
Filtering plates, &c. Apparatus for transporting... V. Lapp  
Fire alarm mechanism... T. A. Long et al  
Fireproof casing... 3 pats... J. J. Plucker  
Fireproof casing for elevator shafts... 5 pats... J. J. Plucker  
Fish line reel... E. D. Rockwell  
Fish pole... C. Hoglund  
Fishing reel brake mechanism... W. Shakespeare Jr. et al  
Fishing reel click mechanism... 2 pats... W. Shakespeare et al  
Fishing rod trimming... J. B. Hall  
Flash light gas burner... D. Ward et al  
Floor. Armored concrete... R. M. McDowell  
Flour mill gearing attachment... N. H. Jorgensen et al  
Flue cleaner... R. S. & C. M. Ruggles  
Fluid extracting press... W. C. Marshall  
Flushing device. Drain pipe... J. H. Doyle  
Flushing drain pipes. Means for... J. H. Doyle  
Fly paper holder... L. B. Truslow  
Folding and creasing device... H. R. Plimpton 2d  
Foot. Artificial... W. F. Mumberg  
Fountain... G. W. Hawes  
Fountain comb... J. R. Harrison  
Fruit box or basket... H. O. Little  
Frying fish, &c. Means or apparatus for... L. H. Stocks  
Fuel. Composition of matter for use as... A. Paul  
Fuel saving apparatus... C. Smith  
Fumes from ores. Apparatus for producing and depositing... W. W. Fyfe  
Furnace dust chamber... F. Cazin et al  
Furnace grate... A. S. Coffin  
Fuse block or cut out for electric circuits... L. C. Scrymser  
Fuse for high explosive shells. Safety... L. Gathmann  
Galvanic battery... H. Halsey  
Galvanic battery... D. L. Winters  
Game... W. A. Justice  
Game apparatus... F. C. Ring  
Game apparatus... F. E. Hunt  
Garment supporter... M. Bew  
Gas burner automatic cut off... L. F. Ducker  
Gas burners. Attachment for Welsbach or similar... G. M. & S. C. Clagett  
Gas engine... W. H. Jones  
Gas engine generator... J. M. Stadel  
Gas generator. Acetylene... F. K. Roberts  
Gas generator. Acetylene... H. A. F. B. H. Tonnie  
Gas shut off. Automatic... J. L. L. Krook  
Gaskets and applying them to sealing caps. Machines for forming... L. M. Keizer  
Gearing for lathes, &c. Change speed... H. L. Flather  
Ginning apparatus... J. T. Fuller  
Glass shingle... J. Simmerman  
Gold from sea water. Obtaining... J. F. Duke  
Governor... J. W. Neil  
Governor mechanism. Explosive engine... W. J. Wright  
Grain cradle... J. C. Counts  
Grain loading or unloading machine... J. T. Smith  
Grain separator and grader... B. F. Smith  
Grinding machine... P. A. Whitney  
Grinding machine. Automatic... A. B. Landis  
Grinding machine. Tool... J. S. Bancroft  
Halter... J. G. Lewis  
Hammer for tinner's use... A. T. Nelson  
Hammers. Throttle valve lock for pneumatic... C. H. Haeseler  
Harness attachment... G. F. Fehring  
Harrow sulky attachment... G. F. Burtch  
Harvester. Corn... R. B. Robbins  
Harvester. Corn... R. C. & L. Beauchamp  
Hat machine... A. A. Whitney  
Hat pin and locking attachment. Permanent... C. C. G. Wolpers  
Hay carrier. Elevated... reissue... S. Jacobs  
Heating apparatus... T. J. March  
Heel making machine... T. H. Mayo  
Helix. Electrical... R. Varley  
Hinge. Awning... H. W. Hale  
Hinge shoe... T. Tribe  
Hook and eye... W. C. Utley et al  
Hopper... N. F. Palmer  
Horse grooming and shampooing machine... A. & P. Bolund  
Hydrocarbons. Treating mineral liquid... C. Hornbostel

Ice making machine... H. G. Randall  
Igniters. Manufacture of electric... A. de Dion et al  
Ignition generator. Electric... B. P. Remy  
Incandescent burner cap and mantle support... T. R. Barnes  
Inking roller... H. M. Parham  
Ironing board... J. A. Pierce  
Ironing shirt bosoms... D. H. Benjamin  
Journal bearing... I. Metzger  
Lace tipping machine. Shoe... S. C. Shepard  
Lacing hook or stud setting machine... W. J. Coombs  
Lamp. Carbureting... W. S. Strowger  
Lamp cluster center. Incandescent... H. Hubbell  
Lamp. Electric arc... F. W. Gore  
Lamp extinguisher... A. Nieto y Abeille et al  
Lamps. Machine for sealing incandescent... F. R. McBerty et al  
Land roller... E. O. Lean  
Lathe attachment... C. E. Brown  
Lathe. Roll turning... J. Thomas  
Launch cover... J. C. Collamore et al  
Lead peroxid. Manufacture of... E. Quedenfeldt  
Leaf support. Automatic hinged... F. A. Schuehle et al  
Leather cutting machine. Sole... G. D. Clapp  
Leg. Adjustable metal... J. Caesar  
Letter opener... I. Minnich  
Linotype machine... D. A. Poe et al  
Linotype or other type casting machines. Space bar... P. F. Jones  
Liquid fuel burner... J. W. Neumann  
Liquid separator. Centrifugal... J. Melotte  
Liquors. Manufacture of fermented... J. Schneible  
Loading device. Vehicle... R. C. Miner et al  
Lock... O. H. P. Green et al  
Lock and latch hub... N. W. Crandall  
Loom pattern chain... W. J. Lutton  
Loom shedding mechanism... G. W. Stafford  
Loom shedding mechanism... C. H. Draper  
Lug. Loose... M. Dean  
Marking machine... E. M. Schantz  
Massage apparatus... J. A. Reade, Jr  
Measure. Optical... S. B. Millard  
Measuring coal &c. Apparatus for... B. Leslie  
Mechanical instrument... L. Frechette  
Metal bars into sheets. Reducing hot... T. V. Allis  
Metals from their compounds. Electrolytic apparatus for recovering... C. E. Baker et al  
Micrometer gage... F. O. Wells  
Microscope... E. Bausch et al  
Milk tester... G. M. Luther  
Milling and boring machine. Combined... A. B. Snowden  
Moistening and sealing device. Envelop... A. & B. Goldstein  
Mower or reaper cutting apparatus... E. A. Johnston  
Muffler... J. G. Heaslet  
Muffler. Exhaust... C. C. Hill  
Muffler. Noise... P. Rauch  
Music roll... R. W. Pain  
Musical instrument... J. C. Deagan  
Musical instrument... G. H. Blair  
Musical instrument automatic playing attachment. Mechanical... H. M. Salyer  
Musical instrument playing attachment. Key... H. M. Salyer  
Musical instrument pneumatic action... H. T. Skelton  
Nails. Implement for the... E. Kaufmann  
Needle threader... T. Holder  
Nut lock... G. H. Layng  
Nut lock... J. E. Lenholt  
Obstetrical instrument... H. Mendenhall  
Oil burner... F. W. H. Jahn  
Oil burner... A. Davis  
Ointment or pill slab... W. Bower  
Ordnance construction... J. Schinneller  
Ore concentrating tables. Head motion for... L. Searing  
Ore separator... C. F. Wheelock  
Oven and dust collector. Combined hot blast... H. W. Edwards  
Overseaming machine... W. H. Stedman  
Package. Shipping... W. H. H. Stineman  
Packing case... J. N. Hahn  
Packing mechanism. Metallic... O. Isherwood  
Paper feeding machine... E. T. Cleathero  
Paper. Machine for coating sun print... J. A. Prince  
Paper manufacture... W. W. McEwan  
Paper polishing machine... L. W. Case  
Parcel strap... E. B. Palmer  
Paring knife... M. MacLean  
Partitions and ceilings. Metallic framing for plastic... C. E. Walker et al  
Pawl and ratchet device... H. W. Cooley  
Pen and pencil retainer. Pocket... R. Kollmar  
Pen. Fountain... F. M. Kegrize  
Pen. Fountain... D. L. Wardroper  
Pen wiper... J. J. Stanley  
Perforating machine slack provider... W. Ackerman  
Photographic curtain shutter... G. F. Fraley  
Photographic plate developing machine... G. F. Fraley  
Piling. Sheet... L. P. Friedstedt  
Pin cushion and paper weight. Combined... C. L. Royer  
Pipe filter or screen. Service... J. F. Bush  
Planter seeding device. Corn... 2 pats... J. Kaylor  
Plating. Nickel... T. A. Edison  
PLOW attachment... F. Gale  
Pneumatic despatch tube system... C. A. Gray  
Pole changer and Crookes tube controller... F. Cedergren  
Polishing wheel... C. G. Lockwood  
Poultry house construction... G. C. Scott  
Poultry perch, feed trough, and vermin exterminator. Reversible combined... J. R. Ressler  
Precious metals. Separating... F. R. Carpenter  
Press feeder mechanism... W. M. Rheem  
Pressure regulator... J. C. Stewart  
Printing or writing machine. Stenographic... J. Lafaurie  
Projectile... C. V. Schou  
Pruning shears... C. F. Holybee  
Pump... R. Whitaker

Pump. Vacuum... R. A. Steeb  
Punch. Multiple... J. H. Ames  
Puzzle... W. A. Justice  
Rail. Educational... E. S. Cobb  
Rail clamp... C. W. Hill  
Rail joint... C. T. Greenwood et al  
Rail joint tie plate... P. W. Mosher  
Rails. Apparatus for unloading and distributing steel... H. Ware  
Railway switch... W. B. Fazakerly  
Railway tie. Cement... G. M. Burbank  
Railway transfer apparatus... H. H. Porter, Jr  
Railways. System of electrical signaling for... C. Barber  
Razor stop... E. Straub  
Receptacle closure... J. H. Rivers  
Recording lock... A. De Vilbiss, Jr  
Refining engine... G. A. Clark et al  
Refrigerator car... C. Zimmerman  
Rein holder... C. B. Mansell  
Reminder... V. Sterki  
Revolver... C. J. Ebbs  
Ring throwing apparatus... J. L. Donaly  
Road working or grading machine... F. Tank  
Rock drill... O. G. Worsley  
Rotary engine... O. Jurtz  
Rotary engine... E. B. Porter  
Rotary explosive engine... R. Cumming  
Rule. Carpenter's... F. E. Clark  
Rule. Combination... A. Gray  
Saud and discharging it therefrom under pressure. Mechanical device for receiving... W. H. Stuart  
Sandpaper holder... 2 pats... F. Reissmann  
Sash lock, lift, and sash supporter... L. W. Hagel  
Sash trimming machine... L. S. & J. N. Heald  
Saw attachment. Hand... C. H. Kohler  
Sawmill steam set works... D. C. Prescott  
Saw set... J. D. Smith  
Scaffold binder... A. T. Sears  
Scale... reissue... 2 pats... A. De Vilbiss, Jr  
Scale for fish poles... R. H. Ward  
Seal... W. S. Davison  
Seal... E. J. Brooks  
Seal press... W. S. Davison  
Seaming machine ejector. Side... C. W. Sleeper  
Seaming machine feeding mechanism. Side... C. W. Sleeper  
Seat cushion... H. S. Hale  
Separator sieve... E. E. Ditch et al  
Sewing machine. Buttonhole... E. B. Allen  
Sewing machine. Chain stitch... C. G. Kramer  
Sewing machine. Hat... E. G. O'Donnell  
Shade holder... H. Hubbell  
Shade roller bearing... C. Flagler  
Shaft coupling... A. W. Cash  
Shaft. Flexible power transmitting... R. Shedenhelm  
Shaft hanger... C. W. Levalley  
Sharpener. Drill... J. H. Hicks  
Shell collecting machine... O. F. Knapp  
Shoe brake... C. W. Hoch  
Show case... W. C. Huss  
Show case... C. E. Wilton  
Shutter... J. J. Plucker  
Shutter fastener... R. Krubetke  
Silo... F. S. Lord  
Skirt... E. A. C. White  
Skirt... C. V. & M. R. Frankenberg  
Skirt. Riding... M. Tauber  
Smelting apparatus... P. Naef  
Speed changing mechanism... W. F. Barnes  
Speeds. Driving mechanism for transmitting variable... W. & G. F. Meischke-Smith  
Speed mechanism. Variable... H. A. Knox  
Spindle bobbin retaining means. Rotatable... C. E. Metcalf  
Spinning spindle... F. J. Rabbeth  
Spring for beds, couches, &c... J. Watkins  
Stamp mill... W. A. Dalton  
Stanchion. Cattle... J. Foster  
Steam engine... C. L. Fouts  
Steam engine... H. K. Lee  
Steam engine... M. Castellan  
Steam generator... F. E. & F. O. Stanley  
Steam generator... G. E. Whitney  
Steam generator... C. M. Hopwood et al  
Steering device... M. W. Patrick  
Stereoscope... H. C. White  
Stirrup detach. Automatic... H. B. K. Rosenfeld  
Stool or chair truck... F. A. Mast  
Stopper... H. Campbell  
Stove or heater. Gas... E. D. Moss  
Street box for underground mains for water, gas, meter, and valve boxes... S. Shanahan  
Stuffing box... R. Titus  
Sucker rod joint... E. B. Campbell  
Sweeper. Rotary... S. B. Hoadley  
Switch lock... H. H. Louis  
Swivel. Rope socket... H. M. Brittan  
Tankage press... J. Morrissey et al  
Tannin extract and making same... G. Klenk  
Target. Electric... W. F. Mangles  
Telegraphy. Vibratory... S. D. Field  
Tellurian... G. V. Clark  
Thill or pole coupling... W. H. Thompson  
Threading machine... H. Koester  
Threshing machine attachment... C. L. Richards  
Ticket control apparatus... A. Alling  
Tile forming machines. Cutting and delivery table for... O. C. Pixley  
Tire and rim. Pneumatic... A. H. Marks  
Tire. Elastic vehifile... H. G. Fiske  
Tire. Pneumatic... 4 pats... A. H. Marks  
Tobacco box or caddy... A. J. Feild  
Toilet article handle... L. B. Prahar  
Tombstone... D. Stewart  
Tongue support. Wagon... H. B. Edgar  
Tool. Pneumatic... W. H. Soley  
Toy. Apple shooting... J. F. Blaisdell  
Toy. Roundabout... C. J. Dorsey  
Traction wheel... H. H. Porter, Jr  
Transformer... J. L. Adams, Jr  
Transparent slide folding box... S. Prager  
Trees or plants. Treating... R. R. Hite  
Trimming machine... J. M. Stetter  
Trolley catch... G. W. Maxwell  
Truck bolster... 3 pats... C. Vanderbilt  
Type casting machine pump... F. E. Peacock  
Type writer attachment... C. J. Bellamy  
Type writer. Electric... G. H. Eunis  
Type writer shift key mechanism... E. J. Manning et al

Type writing machine ruling attachment... C. C. W. Peck  
Umbrella... W. W. Chimonson  
Underreamer... E. Double  
Valve... J. O'Meara  
Valve device... C. J. Diederich  
Valve for boilers. Combined filling and blow-off... W. H. Davis  
Valve gear. Explosive engine... W. H. Jones  
Valve mechanism... T. Simpson  
Valve. Rotary... J. C. Lyons et al  
Valve. Steam... 2 pats... T. J. Kiernan  
Valve. Steam cylinder drain... reissue... H. W. McCombs  
Vault. Burial... E. W. Hoyt  
Vehicle gear... 2 pats... L. E. Hickok et al  
Vehicle gear... 2 pats... F. E. Wilcox  
Vehicle. Ice... I. N. Henness  
Vehicle runner attachment... H. Rinehardt  
Vehicle wheel and bearing therefor... W. L. Martin  
Vending machine... E. Wustner  
Vessel charging or discharging apparatus... H. Shoosmith  
Vise... C. Frantz  
Wagon. Boy's... J. Weber  
Wagon for street cleaning or other purposes. Push... C. E. Hadley  
Washing machine... Z. Gaillard  
Water closet. Non freezing... B. A. Buge  
Water wheel. Turbine... W. O. Crocker  
Weighing scoop... J. S. Alexander  
Well machine... A. Cameron  
Welt support... G. D. Clapp  
Wheel... C. Miller  
Wheel... H. H. Porter, Jr  
Wheel... C. Miller  
Wheel attachment. Traction... L. Blumstein  
Whiffletree clip... W. R. Ayer  
Windmill attachment... C. S. Aiken  
Windows. Means for glazing... A. Diat, dit Diaz  
Wine press... J. Szafka  
Wine press... L. Perotti  
Wire clamp... D. Lockhart  
Wire winding machine... P. V. Austin  
Wood impregnating or staining apparatus... J. Pfister  
Wort. Producing... V. Lapp  
Wrench... J. Horlacher  
Writing machine type bars. Tool for applying type to... E. F. Kunath

### DESIGNS.

Book and paper cutter... O. Cohen  
Dish. Covered... A. J. Meakin  
Hammock body... I. E. Palmer  
Handle for nail files, &c... P. O. Dickinson  
Handle for nail files, &c... O. Leigh  
Plate... A. J. Meakin  
Watch charm or similar article... J. A. Browne

Issued August 4, 1903.

### MECHANICAL PATENTS.

Advertising device... S. S. Fels  
Adz. Single hand... O. Keehm  
Air brake. Automatic... W. C. Shannon et al  
Air brake system... W. B. Mann  
Alternating actuating mechanism... G. W. Whittington  
Anchor for guy ropes, &c... E. E. Whitehead  
Annealing furnace... S. Huxley  
Annunciator... E. M. Hewlett  
Axle. Vehicle... G. B. McWilliams  
Baby jumper... A. Heitmann  
Back pedaling brake... J. H. Whittington  
Bale forming apparatus... W. E. Anderson et al  
Baling press... I. V. Jones  
Barrel protector ring or bushing... P. Hochheimer  
Bath tub. Shower... G. P. Homeier  
Bearing. Ball... O. C. Knipe  
Bed. Invalid... W. McLennan  
Belt tightener... F. H. Gilbert  
Bevel and square. Combined... J. W. Murphy  
Bicycle. Motor... O. E. Waxel  
Binder. Temporary... A. L. Holton  
Blind fastener. Window... T. A. Upson  
Blower. Rotary... P. Forwerger et al  
Boiler setting... S. W. Davis  
Bolt holding implement... J. R. Harrison  
Bolting reel... J. F. Geut  
Book. Blank... H. B. Hooper et al  
Book. Check... J. Franc  
Bookbinding... L. P. Hughes  
Boot or shoe lining... J. A. Burleigh  
Boring or milling machine... C. C. Newton  
Bottle... S. E. George et al  
Bottle... N. D. Adell  
Bottle... P. J. Wilson  
Bottle. Non refillable... L. C. McCarty  
Bottle. Non refillable... A. Diemer  
Bottle. Non refillable... H. Parker  
Bottle wire detacher... P. F. Cassidy  
Box lid and tag holder... H. J. Wieneke  
Box opener... J. W. Mellor  
Brake beam... H. Pries  
Brake block... O. Whitmore  
Brake shoe... J. S. Thompson  
Brick machine... T. M. Boggs  
Bricks for furnaces. Manufacture of... J. E. Kirkpatrick  
Bridge. Bascule... A. H. Scherzer et al  
Brush or cushioned roll. Rotary... H. A. Webster  
Brush. Shower bath... S. E. Robinson  
Bucket... T. Babin et al  
Bucket or conveyer... W. F. Jones  
Bucket or other vessel handle. Coal... R. L. Miller  
Buckets. Means for adjusting intermediate... O. D. H. Bentley  
Buckle... C. S. Comstock  
Buckle. Harness... M. E. Zeller  
Bumping screen... H. L. King  
Burial casket... F. J. Feineman  
Burner... F. A. Ray  
Buttonhole. Stitched... E. B. Allen  
Buttonhole stitching machine... E. B. Allen  
Calculating machine... C. F. Pidgin  
Can attachment... R. E. Gold  
Can attachment. Oil... M. J. Irlbacher



Can filling machine.....J. W. Carnochan  
Candlestick. Miner's.....S. Peterson et al  
Cane stripper.....D. S. Spurlock  
Car brake.....S. H. Graden  
Car door.....F. L. Monson  
Car. Double decked freight.....H. M. Lytle  
Car draft rigging. Railway.....T. W. Saling  
Car. Dump.....W. McCabe  
Car fender.....T. Terzano  
Car fender.....R. C. Layton  
Car platform frame. Railway.....J. G. Lawler  
Car replacer.....O. W. Johnson  
Car. Transfer stock.....F. C. Roberts  
Car uncoupling device.....E. O. Hutsell  
Carriage curtain fastener.....B. Richmond  
Carriage seat.....J. R. Davidson  
Carriage top.....W. H. Kelly  
Cartridge shell.....M. Dreger et al  
Cash register.....J. P. Cleal et al  
Casting ingots.....A. Sauvour et al  
Castings. Making metal.....A. Sauvour  
Ceiling or wall plate. Metal. L. L. Sagendorph  
Centrifugal apparatus.....F. Kessler  
Chair base. Rocking.....A. White  
Chair foot rest.....J. E. Berry  
Chaplet.....C. T. Pratt  
Charging switch.....M. R. Hutchison  
Check controlled lock.....A. Frederiksen  
Cheese press.....E. L. McKinnon  
Cigar box dampening device G. D. Woodworth  
Cigar piercing device.....W. J. Bailey  
Clock. Striking.....H. M. Hunt  
Cloth on the bias. Instrument for cutting.....W. H. Blandin  
Cloth thin place detector and preventer.....B. F. S. Austin  
Clothes line holder.....A. K. Rosenbeck  
Clutch. Friction.....C. W. Hunt  
Coaster brake.....C. Glover  
Coat hanger.....I. F. Baer  
Coat hanger.....J. E. Twitchell  
Cock operating device for steam engines. Automatic.....O. Weitzel  
Comb.....E. B. Kingman  
Commutator brush holder.....C. H. Hines  
Comparative register.....R. W. Messenger  
Composite structure.....J. O. Ellinger  
Compressor suction valve.....E. A. Menking  
Concrete block molding machine.....G. Brady  
Concrete mixing apparatus.....P. Kuhne  
Concrete piles. Making.....F. Shuman  
Concrete walls. Mold for.....A. S. Cramer  
Conduit or culvert.....L. Lane  
Continuous kiln.....W. A. Butler  
Conveyer apparatus.....T. Robins, Jr  
Conveyer. Portable.....W. L. McCabe  
Copy holder. Folding and adjustable.....C. V. Harrod  
Corn. Apparatus for degermination and decortication of.....J. F. Gent  
Corn cutter. Broom.....G. W. Duvall  
Corn husking machine.....C. E. Dunn  
Corn kernel splitting machine.....J. F. Gent  
Corn shock compressor.....F. H. Schwark  
Corn shredder and husker.....H. F. Snyder  
Cotton gin.....J. Brandou  
Cotton opening and cleaning machine.....R. E. Evans  
Cotton press.....E. E. Hanna  
Couch frame. Detachable collapsible.....A. Schrock  
Coupling for straight edges.....H. Boussemere  
Cream separator.....A. D. Luginbuhl et al  
Cuff holder.....J. B. Hough  
Culinary utensil.....J. Hoff  
Current induction motor. Polyphase alternating.....W. Langdon et al  
Current transformer. Constant.....D. O. Hull  
Curtain fixture. Molded.....W. Murphey  
Curtain pole.....J. E. Walz  
Cushion frame.....E. G. Ashley  
Cycle.....A. Oleszkiewicz  
Cycle or vehicle brake.....J. Kelland et al  
Cycle saddle back rest.....H. E. C. Stubbs  
Dam. Movable.....S. C. Irwin et al  
Decoy.....R. H. Syms  
Dentist's clamp.....V. Malizan et al  
Depurator.....L. H. Richards  
Derailer.....M. P. Layton et al  
Desk. Adjustable.....J. N. Stokes  
Die and press stamping tool.....G. Higginson  
Dirt receptacle. Wheeled.....R. C. Menzies  
Dish cleaner.....M. D. Colbath  
Display carton.....H. Clauss  
Display case.....R. A. Stevens  
Display or advertising device.....G. Birch  
Display stand.....H. Stahmer  
Ditching machine.....B. M. Rolph  
Diving apparatus.....J. L. Watson  
Dock. Dry.....T. Neissen  
Door closure. Sliding.....A. Krause  
Dough mixing and kneading machine.....J. W. Ruger  
Draft. Traveler's.....F. L. Gray  
Dredge. Land.....W. W. Jones  
Drier.....A. T. Hagen et al  
Drier.....3 pats.....C. W. Stanton  
Drill bit or other tool.....W. Harvey  
Drill scraper. Disk.....W. Fetzner  
Dumping apparatus.....A. E. Norris  
Dust pan.....A. M. Furrow  
Dust pan.....W. F. McCarthy  
Dyeing or bleaching apparatus.....F. A. Weller  
Easel.....F. P. Dean  
Egg beater.....R. A. Eifert  
Electric light fixture.....J. J. Wood  
Electric motor.....N. C. Bassett  
Electric motor.....T. A. Seitz  
Electric motor controlling means.....J. D. Ihlder  
Electric motor starting switch.....A. R. Everest  
Electric switch.....G. Hail  
Electric switch.....H. Gilmore  
Electric switch.....W. L. Bliss  
Electric protective system.....J. Weatherby, Jr  
Electric distribution and transforming system.....C. M. Palmer  
Electrical distribution system.....S. B. Stewart, Jr  
Electrical distribution system.....G. S. Dunn  
Electrolytic diaphragm.....E. A. Byrnes  
Electromobile charging device.....C. D. Haskins  
Electrostatic motor.....E. Thomson  
Electrotherapeutic apparatus.....S. B. Zink  
Electrotypers' builder iron.....P. A. H. Reinisch  
Elevator cable guard.....O. Greenwald  
Elevator door.....H. Bitner  
Elevator door operating mechanism.....H. Bitner  
Elevator safety stop.....N. O. Lindstrom  
Elevators. Locking device for the shipper mechanism of.....R. Thompson  
Embroidering machine.....F. Mueller

Engine sparking igniter. Explosive.....W. C. Matthias  
Engine starting mechanism. Oil or gasoline.....F. C. Hirsch  
Engine stop.....J. H. Cary  
Engines. Hydrocarbon mixer and regulator for.....G. C. Eskholme  
Engraving machine monogram type.....A. C. Francis  
Entomological, botanical, or natural history specimens. Mount for.....W. D. & R. W. Denton  
Evaporating apparatus. Liquid.....H. Deininger et al  
Excavating machine.....D. S. White  
Exercising apparatus.....A. W. Urwick  
Exercising machine.....2W. H. Chellis et al  
Exhibiting mechanism.....S. Trepp  
Expanding tool.....C. O. Schellenbach  
Explosive engine.....W. Walke  
Eyeglasses.....E. E. Shreiner et al  
Eyeglasses.....W. Bausch  
Eyeglass holder.....L. F. Adt  
Fabrics. Ornamenting.....L. Pauly  
Faucet.....J. Kingory  
Feeder. Automatic stock.....I. Steinberg  
Feeder for headed articles.....J. M. Stetter  
Feeding device for sheets of stock. Automatic.....W. C. Gilbert  
Feeding mechanism for powdered material.....A. L. F. Mitchell et al  
Fence fastener.....C. I. Huxley  
Fence post.....C. A. Birchler  
Fence wire fastener.....C. B. Lombard  
Fibrous material. Pneumatic apparatus for producing mats or bats of.....J. De Long  
Fibrous material. Producing mats or bats of.....J. De Long  
File. Card.....C. K. Keff  
File cutting machine.....W. Branfield  
Fire escape appliance.....E. L. Evens  
Fire extinguisher.....C. J. Eichhorn  
Fire hose nozzle and nozzle device.....E. F. Osborne  
Fire shutter releasing mechanism.....P. Ebner  
Fire wagon.....J. J. Plucker  
Firearm. Gas operated.....S. N. McClean  
Firearms. Top snap and clinder catch for revolving.....A. Fyrberg  
Fireplace fire box.....J. J. M. Lange  
Fireproof compound.....G. C. Rosenleaf  
Fireproof structure.....C. S. Bird  
Fish trap and set net. Floating.....L. Mayhew  
Fish trap pots or spillers. Means for lifting.....A. F. Shadel  
Fishing cork.....W. W. Foust  
Fishing rod.....E. H. Crane  
Flange union.....W. N. Dufford  
Flexible bag.....J. Multer  
Flooring, table top, &c.....S. Fisher  
Fluid motor.....G. White  
Food products from whey. Producing.....A. S. Ramage  
Food products. Producing.....A. S. Ramage  
Foundation construction.....J. W. Kennedy  
Fumigator. Formaldehyde.....L. Feval  
Furnace.....R. A. Carter  
Furnace gas bell.....E. R. Stasch  
Furnace grate.....L. & S. Lehotzky  
Furniture. Article of.....A. Lehmann  
Furniture coupling.....E. Taunewitz  
Fuse. Percussion.....E. Gathmann  
Game apparatus.....J. McCutchen, Jr  
Game table.....G. A. White  
Garment fastener.....3 pats.....A. J. Bradley  
Gas burner. Self igniting.....G. A. W. Barkowsky  
Gas burner apparatus. Fuel.....W. H. Bradley  
Gas check.....F. W. Howson  
Gas generator. Acetylene.....I. L. Harris  
Gas generator and burner for crude petroleum. Hydrocarbon.....D. F. Crowley  
Gas heater.....J. W. Carter  
Gas lighting device.....G. A. W. Barkowsky  
Gas lighter and shut off. Electric automatic.....H. J. Dyons  
Gas. Making.....W. Kent  
Gas producer.....4 pats.....J. W. Gayner  
Gas producer plants. Apparatus for handling coal for.....M. M. Suppes  
Gate.....G. M. Bates  
Gear. Reversing.....S. Guth  
Gearing.....J. R. Carter  
Glass making machine. Sheet.....L. Appert  
Glove.....H. L. Northrop  
Glove.....C. H. Chatfield  
Gold and silver from ores. Extracting.....C. A. Harp et al  
Governor. Engine.....D. W. Payne  
Grate. Dumping.....F. Torrey  
Grease separator.....3 pats.....R. Allert  
Grinding machine.....J. Bercha  
Gun carriage having a swinging barrel carrier.....O. Knuch  
Handle.....J. M. Horton  
Harness rosette.....F. E. Shailor  
Hat fastener.....F. P. McGinn et al  
Hat holder.....A. B. Carlisle  
Hay, &c. Machine for loading and stacking.....S. Mitsch  
Hay ricker.....J. E. Enyart  
Head rest.....H. C. Bliven  
Heating apparatus.....E. Riedel et al  
Heating apparatus. Electric.....D. M. Watson  
Heating system. Hot water.....C. O. Myers  
Heel trimming machine. Boot or shoe.....B. F. Mayo  
Hinge.....A. Ek  
Hinge. Friction.....reissue.....F. E. Sloan  
Hoist, raised track, and dumping device.....W. R. Strickler  
Hook.....D. T. Goodman  
Hook.....G. Banks  
Horseshoe.....H. & P. S. Walker et al  
Horseshoeing device.....L. J. Northern  
Horseshoer's horse holding machine.....C. S. McGowan  
Hose coupling.....J. R. McFall  
Hot air furnace.....J. W. Horsey  
Hub. Vehicle.....W. E., E. A., & A. R. Pound  
Hub. Vehicle.....I. Metzger  
Hydrocarbon burner.....G. L. Badger  
Ice making machine.....R. F. Learned  
Igniting apparatus. Electrical.....W. H. Cotton  
Incubator.....W. P. Sheets  
Incubator.....P. Pederson  
Ingot mold dog or grapple.....L. G. Stitt  
Ingot stripper.....L. G. Stitt  
Insulated joint.....G. A. Weber  
Insulator.....V. G. Converse  
Insulator machine.....J. Waters

Intermediates. Means for adjusting.....O. Junggren et al  
Jar or tank stopper.....W. H. North  
Kiln heater.....W. C. Mitchell  
Ladder brace.....M. P. Hayward  
Lamp burner.....B. F. Fowler  
Lamp chimney.....O. Schott  
Lamp. Electric arc.....C. Senez  
Lamp. Hydrocarbon.....R. Thayer  
Lamp socket.....H. C. Wirt  
Lamp. Vapor.....A. Mende  
Lamps. Ceiling board hanger for arc.....H. C. Wirt  
Land roller.....G. W. Lilley  
Land roller.....J. M. Ebersole  
Lantern casing. Collapsible C. H. Stonebridge  
Lantern. Signal.....reissue.....S. & J. Weber  
Lantern. Signal.....W. S. Hamm  
Lathe.....J. C. Potter et al  
Lathe. Spool cutting.....G. A. Ensign  
Lead or other metals from ores or mattes. Obtaining.....C. Hoepfner  
Letter box.....C. M. Kellner  
Lever connection.....J. J. Green  
Linotype machine.....J. L. Ebaugh  
Liquid depth gage.....E. Wright  
Loading or unloading device.....J. J. Henzie  
Lock.....J. G. Bowles  
Locking bolt.....A. Hazy  
Loom. Kindergarten.....L. A. Truesdell  
Loom warp stop motion.....A. Wenning et al  
Lunch box.....L. E. Broyles  
Mail box attachment. Rural.....J. Muskopf  
Measure.....J. W. Pope  
Measuring instrument. Electrical.....J. F. Stevens  
Meats for boiling. Apparatus for inclosing.....C. F. Weber  
Mechanical movement.....J. W. Ennis  
Mechanical movement.....J. H. Hussey  
Metal cutting machine.....J. L. Backus  
Metal expanding machine.....H. E. White  
Metal working machine.....J. Hartness  
Milling machine and tool.....W. J. Smith  
Mining tool.....T. M. Fisher  
Mining, &c. Wedge or splitting tool for coal.....A. Ivanoff  
Mirror.....C. P. Buckenberger  
Mirror. Adjustable.....W. L. Doughty  
Mirror frame. Hand.....W. C. Howard  
Mixing and dissolving apparatus.....L. P. Borrows  
Moistener. Envelop.....F. C. Ballard  
Molder's sponge.....A. G. Sehmidi  
Molding flask.....E. Harrold et al  
Molding machine.....J. P. Appleby  
Molding machine.....J. W. Deasley  
Mordanting wool, &c.....H. Schrader  
Motor.....T. A. Crossgrove  
Motor.....J. W. Garrett  
Motor.....J. L. Pilling et al  
Motors. Apparatus for controlling alternating current.....A. H. Armstrong  
Motors. Centrifugal starting switch for induction.....H. G. Reist  
Motors. Controlling alternating current.....A. H. Armstrong  
Motors. Controlling induction.....A. P. Zani  
Motors. Operating alternating current induction.....A. P. Zani  
Mowing machine.....W. N. Whitely  
Music box damper.....A. Keller  
Musical instrument tracker board. Automatic.....T. P. Brown  
Needle. Self threading.....L. P. Bunnell et al  
Needle threader.....T. Coffey  
Nose ring. Animal.....E. K. Rea  
Nut lock.....R. Kleckner  
Oil burner.....F. B. Denning  
Oil burner.....J. B. Neuendorf  
Oil burner.....E. Pollak  
Oil burning apparatus.....G. L. Badger  
Oil can and lamp filler.....H. L. Hauser  
Ore buckets. Automatic dumping device for.....R. Nye  
Ores containing gold, silver, copper, nickel, and zinc. Treatment of.....H. Hirschling  
Oven. Knockdown.....M. Flannery  
Package tie. Reversible.....M. S. Field  
Packaging device. Liquid.....G. G. Wickson  
Packing for stuffing boxes. Metallic.....H. J. Gold  
Packing. Metallic.....E. M. Hedley  
Packing ring for stuffing boxes. Automatic lubricating.....G. Huhn  
Pail forming machine.....A. J. Fogg  
Paint compound.....J. F. Smith  
Paper bag machine.....E. J. Howlett  
Paper cutter.....E. J. Smith  
Paper making machines. Wire or felt guide for.....W. M. & T. M. Gilbert et al  
Paper making machinery.....C. E. Torrance  
Paper stock. Treating sulfite, ground wood or other.....J. H. Baker  
Paste.....A. M. Fuller  
Pattern chain.....H. N. Bottomley  
Peat blocks. Pressing.....A. Dobson  
Pegging machine. Shoe.....H. Hamel  
Pen. Fountain.....W. I. Ferris  
Permutation lock.....B. Durlin  
Permutation lock.....R. L. & W. R. Benton  
Photographic film. Flexible.....R. A. Anthony  
Photolithographic transfer plate.....A. Lehmann et al  
Picture mats, stencils, &c. Tool for cutting elliptical or other curved.....V. G. Barr  
Piling. Sheet.....L. P. Friedstedt  
Pineapples. Machine for treating.....G. W. Zastrow  
Pipe.....O. Berger  
Pipe bending machine.....W. R. Smith  
Pipe coupling. Air.....T. J. Thatcher  
Pipe driving head.....O. H. Bunker  
Pipe unions. Sheet metal clamping band with inclined loose displaceable joint for E. Wirtz  
Pipe wrench.....K. Peterson  
Pipes. Clean out stopper for.....D. Craig  
Planter. Seed.....C. L. Ferriott  
Plastic compounds. Producing.....A. Luft  
Plow.....J. N. Hatcher  
Plow. Shovel.....L. R. Randall  
Plow. Wheel.....E. M. Hickman  
Pole tip. Vehicle.....D. K. Stone  
Potato digger.....C. J. Cummings  
Potato digger.....W. H. Harvey  
Potato digger.....H. R. Muenster  
Potter's wheel.....J. S. Fisher  
Printing machine.....H. A. W. Wood  
Printing machine. Wall paper.....J. McCoy  
Printing surfaces. Making half tone.....G. Palmer

Projectile.....G. Schrodell  
Propelling apparatus.....R. W. Shely  
Puff comb. Lady's.....G. L. Winn et al  
Pulp separator.....K. B. Fletcher  
Pump. Artesian well.....T. H. Gallagher  
Pump piston.....J. Hahn  
Pump. Rotary.....E. W. Brooks  
Pumps. Automatic steam governor for.....D. W. Porter  
Punch and feeding mechanism.....F. M. Leavitt  
Punching machine gage.....T. Conley  
Puncture plug.....E. F. Feising et al  
Puzzle.....T. K. Keith  
Pyrometer.....2 pats.....F. W. Taylor et al  
Quartz mill.....J. F. Forward  
Racket and fives apparatus.....Table J. W. Jones  
Rail fastening.....G. A. Weber  
Rail joint.....W. S. Dunagan  
Rail splice bars. Means for securing.....D. F. Vaughan  
Railway switch.....G. C. Tyus  
Railway switch.....J. M. Payne  
Railway system. Electric.....G. T. Hanchett  
Railway system. Surface contact W. B. Potter  
Railway system. Surface contact electric.....W. M. Brown  
Railway tie.....R. W. Thweatt  
Railway tie.....J. Beazley  
Railway tie. Metallic.....J. K. Thoma  
Railway time table jacket. Rotary.....P. S. Butterworth  
Railway tracks. Instrument for determining the gage level and elevation of.....A. H. Glenn  
Railway vehicles in case of derailment. Safety device for.....F. Gehricke et al  
Railways. Electromagnetic switch for electric range and azimuth finder and predictor. Continuous reading.....J. F. Meigs et al  
Range finder.....G. Griffith  
Ratchet wrench.....A. R. McLean  
Razor stop surfacing device H. J. J. Schanzlin  
Recapping device.....W. T. Alsop  
Recording board.....A. E. Huguley  
Refractometer.....W. L. Burnam  
Refractory material. Manufacture of.....A. G. Salamon et al  
Refrigerator for bottled goods.....E. F. Osborne  
Rein holder. Harness.....L. S. Newcomb  
Ribbon mechanism.....J. J. Green  
Rivet or bolt heads. Machine for forming.....L. Loras  
Road scarifier.....H. Morrison  
Rod or pipe coupling.....W. H. Gilbert  
Rolling mill.....H. L. Thompson  
Rolling mill feed table.....J. Kennedy  
Rotary reaction motor.....C. Mundel  
Rotary steam engine.....H. E. Bridge  
Rubber. Vulcanizing.....A. O. Bourn  
Sad iron.....L. A. Miller  
Safe.....W. H. Reynolds et al  
Safety gate.....C. E. Simpson  
Salt cellar.....S. Stevens  
Saw.....Z. Rabie  
Saw sharpening apparatus.....J. Hornby  
Saw soldering apparatus. Band.....G. Ott  
Sawing ivory nuts. Apparatus for J. Hornby  
Scale. Computing.....H. F. Kinsler  
Scale. Recording.....M. Y. Jordan  
Scale. Sack.....G. A. Archambault  
Scraper.....J. P. Hodgins  
Scraper.....F. K. Hoover et al  
Scraper and scoop machine. Swinging.....D. B. James  
Screen plate holder.....J. H. Blaisdell  
Search light shutter.....J. L. Hall  
Semaphore operating device.....H. W. Souder  
Sewage ejector. Automatic.....E. Yeomans  
Sewing machine. Book.....D. M. & D. G. Smyth et al  
Sewing machine feeding device.....E. F. Wilson  
Sewing machine thread cutting device.....E. B. Allen  
Sewing machine throat plate.....J. Douglas  
Sewing machine trimming attachment.....A. J. A. Oesterreich  
Shade adjuster. Window.....C. A. Scheif  
Shades to rollers. Device for attaching window.....W. H. Lyon  
Shell.....E. von Reichenau  
Shipwrecks. Device for locating.....R. Sato  
Shoe. Snow.....C. E. Phelps  
Shrapnel.....B. W. Dunn  
Signal apparatus.....H. W. Souder  
Signaling apparatus. Electric.....2 pats.....H. W. Souder  
Signaling. Apparatus for selective electric.....reissue.....J. S. Stone  
Silo.....J. Farrell  
Slag handling apparatus.....H. J. Glaubitz  
Soap molding machine.....K. Schnetzer  
Sound record cylinders. Forming duplicate.....A. N. Petit  
Sounds. Flexible tube for conveying and receiving articulate.....F. W. Wood  
Speed changing mechanism.....J. D. Curtis  
Speed mechanism.....E. Baseman  
Speed mechanism. Variable.....H. B. Brazier  
Spice box top.....E. B. Millar  
Spirometer.....H. T. Lytleton  
Sprocket tooth.....R. O. Wigley  
Square. Folding.....J. Nelson  
Square. Gage.....J. Campbell  
Stamp mill.....G. C. Richards  
Stamp mill mortar.....J. H. Hendy  
Stave slicer. Barrel.....B. G. Jayne  
Steam boiler.....J. I. Thornycroft  
Steam engine.....H. L. Dickson  
Steam generator.....F. Lamplough  
Steam generator.....F. W. Schirmer  
Steam trap.....W. J. Poole  
Steamer.....C. A. Butler  
Steel.....R. A. Hadfield  
Steel. Chromium-nickel.....R. A. Hadfield  
Steering gear. Electric.....W. L. Merrill  
Stethoscope holder.....W. Jones  
Stove. Grilling or toasting.....C. Adams  
Strain. Single link.....L. Steinberger  
Strain. Spheroidal.....L. Steinberger  
Strainer axle bearing.....P. Reinicke  
Sucker rod antifriction device.....W. L. Black  
Suction pipe.....J. Jorgensen  
Sugar boiler.....J. Czapikowski  
Surgical apparatus.....G. A. Ogle  
Surgical instrument.....R. P. McCully  
Suspender belt.....A. J. Koch  
Suspension fixture.....L. Steinberger  
Swing. Porch.....A. A. Hoffman  
Switch for systems of remote control.....O. M. Lacey  
Switch handle. Electric.....C. G. Perkins



Switch operating device.....G. E. Fry  
Switch operating mechanism. Snap.....W. C. Tregoning  
Synchronizer.....D. J. Richards  
Syringe. Vaginal.....J. R. Lane  
Tablet grading machine.....J. M. MacDonald  
Tack driving machine.....W. E. Trufant  
Tag.....C. D. Meneely et al  
Telegraphs or other strip delivering apparatus  
Attachment for printing.....C. M. Stiner  
Telegraphy. Multiplex.....P. E. Heina  
Tellurian.....C. T. Sibold  
Temperature of heated articles or receptacles.  
Determining and regulating the.....H. L. Gantt et al  
Temperature of heated articles or receptacles.  
Determining and regulating the.....F. W. Taylor et al  
Therapeutical apparatus.....A. Pollack et al  
Thresher.....T. Powell  
Tile, Imitation.....W. N. Cornell  
Tile molding machine.....E. S. Lafferty  
Tire. Cushion.....J. H. Toole  
Tire. Detachable.....H. E. Irwin  
Tire. Vehicle.....C. L. Henderson  
Toaster.....J. E. Harkins et al  
Toilet package cabinet.....F. H. Dawes  
Tool holder.....J. M. Normand  
Tool. Impact.....C. B. Richards  
Trace carrier.....W. O. Barnett  
Track laying machine.....E. J. Brennan  
Train operating device.....S. Kashichi  
Trolley contact.....H. W. Souder  
Trolley harp axle locking device.....J. Wiggins  
Trolley retriever.....A. W. Knutson  
Trolley wheel.....R. & R. W. Fox  
Trough mold.....H. A. Huttinger  
Truck and hoist. Combined.....S. E. Mitchell  
Truck. Radial swing.....B. R. Van Kirk  
Truss. Hernia.....C. & F. Weck  
Turbine.....O. Junggren  
Turbine. Elastic fluid.....O. Junggren  
Turbine. Steam.....E. F. Cameron  
Turbines. Simultaneously adjustable nozzle  
and intermediate for.....O. Junggren  
Turnstiles. Machine for registering at a distance  
admission by.....A. Marsh  
Type writer.....A. Kempf  
Typewriter carriage shifting mechanism.....R. T. Gillespie  
Typewriter tabulating device.....A. Halstreen  
Typewriter type bar.....J. J. Green  
Typewriter word counting attachment.....J. G. Coleman et al  
Typewriters, &c. Type bar guide for C. D. Rice  
Type writing machine.....2 pats. J. J. Green  
Type writing machine.....R. W. Uhlig  
Umbrella holder.....R. E. Bradbury  
Valve.....P. Settino  
Valve. Automatic choke.....F. W. Edwards  
Valve. Automatic closing.....J. Kuoche  
Valve. Rotary engine reversing.....F. J. Waters  
Valve. Water gage.....J. C. F. Jones  
Vapor burner.....W. L. Duham et al  
Vapor burner.....E. Thomson  
Vaporizer. Crude oil.....F. G. Hobart  
Vehicle body.....G. E. Elsey  
Vehicle brake.....M. F. & H. C. Hartman  
Vehicle. Motor.....R. H. Hassler  
Vehicle reach or coupling pole.....J. Prentiss et al  
Vehicle wheel.....R. O. Wilcox  
Vehicles. Means for controlling the movements of.....F. E. Kinsman  
Vending machine.....H. S. Mills  
Vessel hull.....H. N. Whittelsey  
Veterinary dental instrument.....J. M. Phillips  
Violin sound post.....H. Unger  
Wagon brake. Automatic.....J. A. Manor  
Wagon standard.....W. J. Donnell  
Waist fastener and skirt supporter.....S. L. Feathers  
Water cooler.....H. C. Price  
Water heater.....W. Damm  
Water heater. Combined solar and artificial heat.....F. Walker  
Water tube boiler.....W. R. Cummins  
Wave motor.....J. C. Hergenhan et al  
Wax. Artificial.....J. Lewy  
Welding. Metal.....H. Goldschmidt  
Well drilling machine.....W. N. Dufford  
Wells. Apparatus for raising liquids from.....T. F. Moran et al  
Whistle tree.....D. A. Morrison  
Window bead fastener.....G. H. Parker  
Wire clip.....G. W. McGill  
Wire and lead. Making articles of.....E. Polte  
Wood steaming apparatus.....C. W. Stanton  
Wool washing machine.....H. S. Frank  
Wrapping and labeling machine pasting mechanism.....C. Owens  
Wrench.....R. P. Hart  
Yoke wear plate. Neck.....E. C. Rishel  
Zinc, lead, and silver sulfides from their ores.  
Extraction of.....G. D. Delprat

## DESIGNS.

Badge.....S. Goodman  
Bottle.....L. F. Richards  
Bottle.....C. B. Gordon  
Brushes or similar articles. Back for.....2 pats. H. A. Weihman  
Brushes or similar toilet articles. Back for.....2 pats. T. K. Benton  
Match safe.....B. M. Ward  
Ornament for vessels, &c.....E. Bachle  
Picture frame.....H. L. Meyer  
Pillow cover. Sofa.....C. M. Draper  
Spoons or similar articles. Handle for.....E. Crees et al  
Spoons or similar articles. Handle for.....J. E. Straker, Jr  
Stand.....G. D. Chisholm  
Tiling.....A. A. Spadone

Issued August 11, 1903.

## MECHANICAL PATENTS.

Acids. Apparatus for making sulfuric or other.....J. G. Graham  
Advertising novelty.....W. A. Demmon  
Aerated liquid dispensing apparatus.....J. J. McLaughlin  
Air brake automatic safety stop.....W. H. Hughes et al  
Air brake connection.....S. Feust et al  
Air brake. Railway.....P. Jacobson  
Air compressor cylinder water jacket.....J. H. Herron

Air compressor governor.....J. H. Herron  
Air inlet for the sanitary ventilation of the drainage systems of the houses, buildings, &c. Fresh.....G. Cody  
Alimentary paste drying apparatus.....J. Allocatti  
Alloy and making same.....A. Ramsdell  
Ammunition hoist for ordnance.....A. T. Dawson et al  
Amusement device.....A. Seyfried  
Anchor stowing mechanism. Ship.....J. Kidd  
Anesthetics. Device for administering.....G. L. Bennett  
Animal trap.....G. F. Eberhard  
Atmosphere. Apparatus for automatically controlling the humidity of.....O. E. Boggs  
Atomizing and carbureting device.....W. Sams  
Automobile driving gear.....K. G. Johnston  
Axle. Vehicle.....J. T. Kenter  
Awning operating mechanism.....M. F. Wiedemann  
Bail air. Vessel.....J. F. Vogt  
Baking iron. Wafer.....L. Rifkin et al  
Baling machine. Straw.....G. J. Freese  
Balls. Making hollow.....C. Davis  
Banana shipping case.....F. Schmitz  
Bank.....E. W. Buechling  
Bark removing machine.....J. Morean  
Bath seat.....W. H. Silver  
Bathing apparatus. Portable.....L. V. Gray  
Batteries. Treating lead plates for use in secondary.....C. J. Reed  
Battery electrolytes. Composition of matter for.....W. Peto et al  
Battery plate and making same. Secondary.....A. F. Clark  
Battery separator. Secondary.....A. F. Clark  
Bed.....C. A. Needham  
Bed.....J. Wyssa  
Beehive.....F. Dauzenbaker  
Beet digger.....T. F. Fitzsimmons  
Bending machine or tool.....B. S. Peard  
Bicycles, &c. Variable gearing for.....F. Mitchell  
Binder.....W. C. Walker  
Binder. Temporary.....M. P. Jackson  
Binder. Temporary.....J. W. Harsha  
Blotting pad.....W. A. Murray  
Blowers or pumps. Impeller for rotary.....H. A. Wainwright  
Boiler or other furnace.....G. C. Way  
Boiler superheater.....C. Gottwald  
Bolting machine. Undulatory.....E. R. Draver  
Book. Index.....C. J. Seidensticker et al  
Books, &c. Machine for trimming.....E. B. Stimpson  
Boot calk.....A. B. Lipscomb  
Boring machine.....A. M. Newell  
Bottle cap.....E. Norton  
Bottle filling and sealing machine.....E. D. Schmidt  
Bottle. Hot water.....J. Holland  
Bottle. Nursing.....M. Cantwell  
Bottle soaking machine.....S. Volz  
Bottle washing machine.....A. A. Busch, et al  
Bottle washing machine.....V. Lapp  
Bow.....J. J. Adams  
Bowls. Manufacture of integral stems and bases for blown.....C. G. Drew  
Box.....A. Gallo  
Box or receptacle.....L. H. Rogers  
Brake coupling. Automatic fluid pressure.....H. Kelley et al  
Branding iron.....A. A. Phipps  
Bricks, &c. Apparatus for drying.....C. Berhenke  
Brooder.....E. Schill  
Broom hanger.....W. S. De Woody  
Brush.....M. McCarthy  
Brush. Automatic screen.....M. R. Crofoot  
Brush back drilling and filling machine.....C. E. Flemming  
Brush. Electric.....C. T. Richmond  
Building block.....H. E. Goodwin  
Buildings. Construction of hospitals, sanatoriums, or other.....D. Sarason  
Burglar alarm and sash lock.....L. H. Handy et al  
Burial receptacle.....J. C. F. McGriff  
Camera back. Reversible.....F. B. Case  
Camera feeding device. Magazine.....J. C. Fyfe et al  
Camera focusing hood.....F. B. La May et al  
Camera. Photographic.....F. B. Case  
Camera. Sketching.....W. L. Beebe et al  
Cameras. Connection for the swinging elements of.....F. B. Case  
Can bodies. Manufacture of key-opening tongued tearing strip.....B. H. Larkin  
Cans. Manufacture of key-opening tongued-tearing strip.....G. W. Weber  
Candle. Ornamental multiple.....W. S. De Woody  
Candy. Pulling.....C. Thibodeau  
Cap or cartridge receptacle.....J. W. Grubbs  
Car coupling.....P. Baker  
Car coupling.....W. S. Lee  
Car coupling.....J. C. Yeiser  
Car loader.....D. H. Claudon  
Car sign. Removable street.....J. K. Coleman et al  
Car wheels. Molding.....A. F. Howe  
Carbon tetrachloride.....C. Combes  
Card holder.....S. H. Owens  
Carriage top operating device.....J. H. King  
Cartons or the like. Machine for setting up and filling.....W. H. Doble  
Cast steel wheel.....T. B. Zell  
Caster.....C. Stengel  
Centering. Hanger for temporary.....G. B. Waite  
Cetyl guaiacyl and making same.....M. W. Beylik  
Chain and sprocket wheel therefor. Drive.....F. V. Hetzel  
Change making apparatus.....J. W. Munson  
Check and sales slip holder.....W. Morton  
Chocolate manufacturing machine.....E. P. F. Magniez  
Circuit Breaker.....E. P. Warner  
Clamp.....J. Turck  
Clipper. Hair.....M. S. Black  
Cloth cutting machine.....E. M. Waring  
Clothing hanger.....T. D. Sugrue  
Clutch. Friction.....R. M. Phillips  
Clutch. Hoisting machine.....P. F. Dundon  
Coal hoist.....G. Gillfooy  
Coal or other materials. Classifying apparatus for.....F. Blanc  
Coffee concentrate and making same.....S. Kato  
Coil spring.....V. Meyer  
Coin detective.....G. W. Brown

Coin holder.....P. C. Fish  
Coke conveyor.....E. G. B. Korting  
Coke oven door.....G. D. Macdonald  
Collar shield. Horse.....B. F. George  
Collar throat brace. Horse.....J. H. Miller  
Combining machine. Wool.....T. A. Jackson et al  
Commutator brush.....C. Wirt  
Concentrator.....I. Sutton  
Concrete building blocks. Machine for manufacturing hollow.....F. A. Borst et al  
Concrete construction. Steel.....W. W. Guest  
Concrete mixer.....L. G. Haase  
Conveyer.....A. J. Webster  
Conveyer apron.....S. G. Touchstone  
Cooker. Steam.....E. C. Peters  
Copy holder.....W. H. Peak  
Cork retainer.....W. E. Brown  
Corn fodder shredder.....W. H. Beidler  
Corset.....N. Temple  
Corset.....T. Schottlander  
Cotton gin.....A. M. Dastur  
Cover. Culinary vessel.....J. Stone  
Crate. Folding.....B. K. Boyd  
Crossing and double slip switch with movable center point. Combination.....W. C. Lee et al  
Crutch arm rest.....H. S. Cole  
Cultivator.....S. P. Kimball  
Cultivator.....W. R. Knaub  
Cultivator. Vineyard or orchard.....I. B. Kilgore  
Current motor. Alternating.....F. L. O'Bryan  
Cutters. Mechanism for driving and adjusting rotary.....C. R. Gabriel  
Demonstration and instruction strip. Combined.....F. A. Glidden  
Dental mixing tablet.....J. N. Woolverton  
Dental mouth prop, mirror, and tongue protector.....W. Hare  
Dental tool.....G. B. Hough  
Desk. Portable.....J. B. Elliott  
Desks. Support for attachment to.....W. J. Bell  
Dish washer.....J. Strelitzer  
Display cabinet.....J. L. Tandy  
Display rack.....T. Rabe  
Display stand.....C. F. Nye  
Diving apparatus.....E. B. Petrie et al  
Door check and spring.....O. C. Rixson  
Door locking attachment.....W. H. Gariz  
Door. Sliding.....J. J. Hennessey  
Door. Sliding.....E. E. Maunter  
Double and swingle tree.....A. C. James  
Draft equalizer.....F. Bailer  
Draught gear. Friction.....A. Christianson  
Dress suit cases or trunks. Strap holder for.....I. Bienenstock  
Dress supporting pin.....C. Metternich  
Drier.....J. H. Morong  
Drying apparatus. Laundry.....J. Lingo  
Drill device bearing.....O. A. Poirier  
Drilling machine.....A. Marek  
Dust collector.....W. A. Derby  
Dust collectors, &c. Dust proof joint packing for.....H. C. Draver  
Dye. Substantive sulfur.....P. Julius et al  
Dynamo gearing for railway vehicles.....H. Weston  
Edging for open work goods.....S. Borton  
Egg beater.....M. Smith et al  
Electric battery.....2 pats. H. Halsey  
Electric brake.....G. A. Le Fevre  
Electric circuits' Mercury safety attachment for.....E. Mies  
Electric coil.....R. Varley  
Electric currents for electrolysis. Apparatus for.....F. E. Elmore  
Electric distribution regulating system.....L. Lyndon  
Electric heater.....J. F. McElroy  
Electric motor control.....F. A. Merrick  
Electric switch.....H. O. Swoboda  
Electric switch.....C. C. Gould  
Electrical coil.....R. Varley  
Electrical distribution regulating system.....L. Lyndon  
Electrical machine synchronizing apparatus.....P. M. Lincoln  
Electrical switch.....R. L. Border  
Electricity Generating.....J. H. Reid  
Electromagnet.....A. Green  
Elevator frame.....S. K. Dennis  
Elevator gate operating device.....H. J. Guth  
Embossing or punching machine.....H. Casler  
Embossing press.....C. Seybold  
Engine controlling means.....O. C. Duryea et al  
Engine igniting attachment. Explosive.....J. D. McFarland, Jr  
Engine sparking device. Gas.....J. M. Wilson  
Engines. Rebound preventing device for gas.....C. Schrotz  
Envelope.....L. W. Pritzkow  
Eyelet setting machine.....E. B. Stimpson  
Eyeletting machine.....E. B. Stimpson  
Fastener.....E. B. Stimpson  
Fastening.....C. E. Morgan  
Faucet. Mixing.....W. L. Rose et al  
Feed mechanism. Automatic M. C. White et al  
Feed water heater and purifier.....R. D. H. Anderson  
Feed water heater and purifier.....C. K. Cunningham  
Feet. Device for preventing flat.....C. L. Darby  
Fence.....D. F. Beard  
Fence feeder and crimper. Wire.....M. D. Taylor  
Fence post.....J. & W. H. Beazley  
Fence post.....F. J. Peterson  
Fence post.....I. M. Warner  
Fence stretcher. Wire.....I. M. Warner  
Fencing. Wire.....W. Grattan  
File. Account.....E. T. Randle  
File cabinet.....C. Kline  
File. Paper.....S. Chiger  
Filter.....2 pats. L. B. Skinner  
Filter.....G. W. Johnston  
Fire escape.....E. Banhagel  
Fire ladder and escape means. Combined.....W. Hubart  
Fires. Automatic sprinkler for extinguishing.....J. G. Grimsley  
Firearm sight.....C. Huber  
Fish opening and cleaning machine.....T. Morris  
Floor construction.....J. Trunzer  
Flooring. boarded ceiling, &c. Separable.....P. B. Guilhou  
Flue scraper.....P. F. Vogt  
Fluid pressure engine.....3 pats. M. N. Forney  
Fluid transfer switch.....E. A. July  
Folding box or crate.....J. W. Prasky  
Folding chair.....T. W. Washburn  
Freezing the ground.....C. Soosmith  
Fruit gatherer.....L. Scarbrough  
Fuel. Manufacturing artificial.....H. C. B. Forester  
Furnace distributor. Blast.....J. Cook  
Furnace door.....J. S. Cooper

Furnaces. Apparatus for feeding pulverized fuel to.....J. E. Baldwin  
Furnaces, &c. Attachment for.....A. G. Ingalls  
Furniture fixture.....C. Franck  
Fuse apparatus. Protective.....W. L. Richards  
Fuse box. Electric.....J. J. Wood  
Fused substances. Apparatus for the electrolysis of.....C. W. Roepper  
Gage.....F. T. Cable  
Game and toy.....W. Maxwell  
Game apparatus.....C. M. Mumford  
Garment hanger.....I. Scott  
Garment hanger.....M. E. Pike  
Gas battery.....J. H. Reid  
Gas engine.....H. H. Mulherin  
Gas engine.....E. B. & L. S. Cushman  
Gas fixture.....R. L. Smith et al  
Gas furnace.....P. S. Harvey  
Gas generator. Acetylene.....J. McLean  
Gas generator. Acetylene.....W. F. Bolly  
Gas heated comb.....R. D. O. Johnson  
Gas heater.....2 pats. J. C. Goodwin  
Glass making. Wire.....J. A. Swearer et al  
Glass ornamenting machine.....J. M. Conroy  
Glass. Working.....O. A. Mygatt  
Glassware. Apparatus for making.....M. H. Hart  
Gold crowns. Apparatus for swaging.....B. B. Brewer et al  
Golf ball.....4 pats. C. Davis  
Governor.....N. Lombard  
Governor. Centrifugal.....N. Lombard  
Governor. Engine.....W. O. Worth  
Grain cleaning and scouring machine.....H. C. Jeffers  
Grinding or polishing cone.....L. G. Koenig  
Grinding tracers and tools for engraving machines. Machine for.....M. Barr  
Gripping device.....B. W. Truscott  
Gums from trees. Collecting.....J. G. Gardner  
Halter and hitching rope. Combined.....J. M. Little  
Hammer.....B. F. Jinks et al  
Hammer. Artificial.....H. Patton  
Harmonium stop key mechanism.....C. Hesse  
Harvester binding mechanism. Grain.....S. K. Dennis  
Harvester. Broom corn.....I. O. Baxter  
Harvester. Broom corn.....J. W. Peifer  
Hat or the like.....S. H. Meerza  
Hatch fastener.....T. B. Armstrong  
Header.....E. A. Johnston  
Heat. Device for effecting the radiation of.....F. T. Clark  
Heater.....G. W. Brunner  
Heating apparatus.....D. M. Horton  
Hemoglobin preparations. Making.....F. Hanssen  
Hide fleshing machine.....W. E. Lombard et al  
Hoisting machine.....L. W. Delp  
Hopple.....J. Fenstermaker  
Horses' eyes. Apparatus for covering.....C. A. P. von Winkler  
Hose and pipe coupling.....A. B. Beatty  
Hose clamp.....F. T. Lippincott  
Hose coupling.....G. P. Jones  
Hose coupling.....J. Whiteford  
Hose handler and clamp.....T. McGill  
Hotel register.....C. H. Harger  
Hydraulic drill.....2 pats. P. Higgins  
Hydrocarbon burner.....J. J. Jordan et al  
Hydrocarbon burner attachment.....F. A. Reynolds  
Hydrocarbon vapor generator.....J. F. Shelton  
Incubator.....C. B. Kenyon  
Incubator.....O. W. Randolph  
Indicator lock.....P. Yoe  
Ingots from molds. Mechanism for stripping.....W. H. Morse  
Inhaling apparatus.....T. Kautz  
Inkstand.....J. W. Jacobus  
Internal combustion engine.....F. H. Gile  
Jewelry and producing same.....W. A. Malliet  
Jewelry cluster setting.....H. Levin  
Knitting frame.....T. Lieberknecht  
Knitting machine. Automatic rib.....G. W. Ruth  
Knob.....C. O. Noack  
Lace fastener.....J. H. O'Brien  
Lace fastener. Shoe.....E. D. Smith  
Lacing device for boots or shoes, &c.....G. W. Johnston  
Lamp. Electric arc.....T. L. Carbone  
Lamp. Electric incandescent.....C. H. Carter  
Lamp. Gas.....W. G. Midgley  
Lamp glowers. Apparatus for treating electric.....M. W. Hanks  
Lamp glowers. Making electric M. W. Hanks  
Lamp sockets. Making fiber insulating linings for incandescent.....O. E. Kenney  
Lantern. Magic.....2 pats. S. Hamburger  
Latch. Gate.....H. C. Carter  
Lathe speed changing mechanism. Automatic.....J. P. Brophy  
Lattice or truss girder, &c.....F. Visintini  
Leather finishing machine.....C. Shepard  
Leather. Ornamenting.....S. Slade et al  
Lemon squeezer.....R. L. Dorsey  
Lens carriage. Laterally adjustable.....F. B. Case  
Level and plumb.....D. F. Collicutt  
Liquid cooler.....M. A. Connor  
Liquid from liquid containing same. Apparatus for separating volatile.....W. Erben et al  
Liquids. Apparatus for drawing off or dispensing aerated or other.....J. Fletcher  
Liquors. Purifying alcoholic.....J. Howden  
Load retaining or releasing means for vehicles.....D. McLaughlin  
Load retaining or releasing means for vehicles.....E. H. B. Knowlton  
Locomotive air feeding apparatus.....F. P. Busiel  
Logging jack.....J. G. Owen  
Loom shuttle. Weaver's.....E. G. Ferreira  
Loom warp stop motion.....J. E. Lemyre  
Lubricant and making same.....S. A. Smith  
Lubricator.....H. James  
Mail bag fastener.....J. W. Shallenberger  
Manure gatherer and loader.....J. Peterson  
Mapping instrument.....J. F. D. Schrader  
Massage implement.....J. J. Grobe  
Measure. Combination.....E. H. Darsie  
Measure. Tailor's tape.....J. M. Adamson  
Measuring cabinet. Computing.....E. J. Austin  
Measuring illumination.....D. Burnett  
Measuring tool. Combination.....C. E. Billings  
Mechanical movement.....G. H. Burpee  
Mechanical movement.....J. W. Martin  
Memorizer.....M. E. Nicholl  
Metal extracting and ore lixiviating apparatus.....G. S. Foster et al  
Metal. Producing uniformity of quality in molten.....R. G. G. Moldenke  
Metal working apparatus. Clamping device for electric.....A. F. Rietzel  
Mile or sign post.....L. Weglein, Jr



Milk cooler.....C. R. Gibson  
 Mine timber framing machine.....C. K. Barnes et al  
 Mop cabinet.....H. H. Bonney  
 Mop wringer.....A. M. Burnham  
 Motion reversing device.....reissue  
 Movable furnace.....G. E. Tregurtha  
 Mule, Self-acting.....F. Houget et al  
 Music sheet for mechanical musical instruments.....C. L. Davis  
 Musical instrument, Key wind.....B. Paris  
 Nail holding device.....G. Horton  
 Nebulizer.....T. De Vilbiss  
 Nitro and azo compounds, Reduction of.....M. Buchner  
 Nitro compounds, Reduction of.....M. Buchner  
 Nitro compounds, Reduction of aromatic.....M. Buchner  
 Noodle cutter.....W. S. De Woody  
 Nozzle, Variable exhaust.....G. H. Gray  
 Nut, Lock.....J. H. Martin  
 Nut, Lock.....W. A. Whitney  
 Nut or bolt lock.....W. H. Burns  
 Ordnance, Breech loading.....W. H. Bevans  
 Ore crusher, Assayer's.....A. C. Calkins  
 Ore separator.....O. F. Pira et al  
 Ores with solvents, Apparatus for the treatment of.....H. T. Durant  
 Organ.....O. H. Arno et al  
 Oven door.....E. A. C. Petersen  
 Overshoe.....A. E. Roberts  
 Package tie.....S. C. Herbert  
 Packing material, Hot rivet joint.....L. Lakeberg  
 Packing, Rod.....G. W. Schultz  
 Paddle wheel.....F. Exline  
 Paint box.....G. H. Williams  
 Paper folding or plating machine.....J. Dowling  
 Paper glassing machine.....K. E. Rogers  
 Paper, &c. Machinery for folding.....R. C. Seymour  
 Paper pulp, Means for separating magnetic particles from.....C. J. Reed  
 Paper weight and pen holder, Combined.....W. G. Sirrine  
 Paraffin direct cooling device.....C. H. Hatton  
 Pattern drafting device for garments.....E. P. Follett  
 Peas or the like, Apparatus for facilitating the picking or sorting of dried.....J. Major  
 Penholder.....J. H. Woolsey  
 Phonographs, Automatic return feed mechanism for.....G. Wood  
 Piano card punching machine.....J. B. Davidson  
 Picture, Changeable.....2 pats.....J. Stevenson  
 Pincushion.....F. Stang  
 Pipe coupling, Train.....J. C. Martin, Jr  
 Piston rod joint.....J. D. McFarland, Jr  
 Pitman.....T. Cronin  
 Plane.....C. H. Fox  
 Plant setting, Locator for use in.....N. Hostettler  
 Planter.....E. M. Heylman  
 Planter attachment.....W. H. Sandifer et al  
 Planter, Combined check row and drill.....W. Sobey  
 Plow or cultivator attachment.....W. R. Usry  
 Plow rotary tool.....W. Lorenz  
 Pneumatic passage way.....J. G. & M. O. Rehffuss  
 Pneumatic tube system.....W. G. Davis  
 Potato digger and listing plow, Combined.....J. T. Clark  
 Powder upon vines, plants, or the like, Apparatus for distributing.....G. Lagomarsino  
 Power transmitting mechanism.....W. Cooper  
 Precious metals, Apparatus for the recovery of.....H. L. Sulman et al  
 Print mounting device.....F. Sauer  
 Printer's quoin.....W. S. Decker  
 Printing apparatus, Wall paper.....J. A. Watson  
 Printing machine.....W. K. Hodgman  
 Printing machine, Wall paper.....J. A. Watson  
 Printing press ink distributing apparatus.....G. W. Prouty  
 Printing surfaces, Making multicolor.....A. von Beust  
 Propeller.....A. C. J. H. McIntosh  
 Propeller, Screw.....G. Pinkert  
 Pulley rim curving machine.....E. G. Budd  
 Pulp strainer.....F. M. & C. E. Chapman et al  
 Pump.....J. S. C. Bonham  
 Pump, Centrifugal.....J. H. C. Petersen  
 Pump, Centrifugal suction.....J. H. C. Petersen  
 Pump for portable engines or the like.....W. W. Dingee  
 Pump, High speed rotary.....2 pats.....J. W. Alvord  
 Pump shafts in well casings, Means for aligning.....J. W. Alvord  
 Punch, Conductor's.....R. J. Krauthelm  
 Punching bag supporting mechanism.....E. J. & H. Goldsmith  
 Punching machine.....E. B. Stimpson  
 Puzzle.....C. E. Haynes  
 Quick acting clamp.....A. M. Colt  
 Quicksilver furnace.....A. A. Tregidgo  
 Rail chair and coupling, Beltless.....F. H. Holman et al  
 Rail electric systems, Traveling connector for third.....J. W. Perkins  
 Rail joint.....W. S. De Woody  
 Rail joint.....J. E. Dutton  
 Rail joint.....P. J. Lukes  
 Rail joint and nut lock, Combined.....L. N. Reed  
 Railway brake.....P. Hallott  
 Railway coach chair, Convertible.....L. Peterson  
 Railway cross tie.....O. H. Odell  
 Railway switch, Electromagnetic.....R. A. Baldwin  
 Railway vehicles or trains, Controlling system for.....J. L. Crouse  
 Rasp.....J. H. Rohret  
 Ratchet wrench.....D. L. Winters  
 Razor stop.....G. W. Korn  
 Receptacle base, Cushioned.....F. & H. F. Keil  
 Refrigerator alarm.....C. Kleifgen  
 Rendering apparatus.....F. Kleinschmidt et al  
 Respirator.....F. Folkmar  
 Rheostat and resistance element therefor.....C. J. Reed  
 Rings, Brooches, &c. Cluster setting for.....F. W. Rohde  
 Rock drill.....H. A. Dalmas  
 Rock drill.....P. Higgins  
 Rotary engine.....J. H. Pitkin  
 Rotary explosive motor.....A. Primat

Rotary motor.....E. R. Douglas  
 Rotary motor, Reciprocating.....H. de Chardonnet  
 Roving clamp.....2 pats.....C. T. Hawley  
 Rubber boots, &c. Device for patching.....H. H. Gove  
 Rubber shoes, &c. Attachment for.....W. Foreman et al  
 Saddletree, Harness.....J. Sanftleben  
 Safe.....H. C. Lowrie  
 Safety apparatus.....reissue.....H. K. Whitner  
 Sandal.....P. E. Bassett  
 Sash lock, Window.....E. O'Neill  
 Saw sharpening device.....G. A. W. & J. H. L. Folkers  
 Scraper, Foot.....F. E. Krauth  
 Scraper, Road.....R. L. Templeman  
 Screen.....W. Oates, Jr  
 Screen system.....W. H. Picher et al  
 Screw plate.....F. E. Wells  
 Seal lock.....J. J. Russell  
 Sealing device, Envelop.....A. H. Pitney  
 Sealing machine, Automatic vacuum can.....J. G. Hodgson  
 Sewing machine, Overedge.....S. Borton  
 Sewing machine trimming attachment.....B. Bissinger  
 Shade and curtain bracket, Combination.....J. E. French  
 Shade and curtain fixture, Window.....G. Retzko  
 Shade and curtain fixture, Window.....S. A. Norwood  
 Shade and ventilator, Combination window.....S. S. Gable  
 Shade trimming apparatus, Window.....J. A. Tufts  
 Shaft collar.....B. Hecht  
 Shaft split collar.....R. W. Scott et al  
 Sharpener, Scissors.....T. G. Goodfellow  
 Shoe cabinet.....V. P. Orrick  
 Shoe, Extension.....J. F. Wireback  
 Shoe holding device.....A. J. Skinner  
 Shoe rest.....R. V. Winter  
 Sieve, Grain.....E. Huber  
 Sign, Changeable.....T. W. Loaring  
 Sign, Changeable.....M. B. Disken  
 Signal indicator, Electromagnetic.....W. W. Dean  
 Signaling system, Electrical.....J. L. Wrenn  
 Sled runner nose piece.....J. J. Petertyl  
 Smoke, fume, and gas condensing apparatus.....R. Ogie  
 Soldering iron.....R. E. Manley  
 Soot cleaner.....E. Green  
 Spacing instrument.....D. W. Stinson  
 Spectacle fitting.....E. B. Temple  
 Spinning machine guide board.....H. R. Mitchell  
 Spinning mule antisnarling motion.....T. McAuliffe  
 Squaring device, Foundation.....J. C. Paul  
 Stacker, Hay.....J. Law  
 Stamp feeding and cutting mechanism.....M. E. Woodford  
 Stamp, Time.....W. D. Chandler  
 Starching machine.....H. Grunhagen  
 Steam boiler.....C. Campus  
 Steam generator.....L. E. Wright  
 Steamer and heater, Wheat.....R. E. Hutton  
 Steel making, Compound for use in.....W. A. Givens  
 Stereotype casting box.....C. S. Partridge  
 Stocking stretching device.....M. Thus  
 Stocker, Mechanical furnace.....F. Burger  
 Storage battery.....A. V. Meserole  
 Stove charcoal cooking attachment.....R. Fletcher  
 Stove, Gas.....A. L. Gibson  
 Stove oven revolving grate.....I. Sanford  
 Stovepipe.....H. Ditchburn  
 Strap lock.....W. P. C. Adams  
 Street or station indicator.....A. T. Chester  
 Street washer.....T. M. Murphy  
 Superheater.....H. Michaeluk  
 Support, Slidable.....J. C. Dahlquist  
 Surgical instrument case, Sterilizable.....H. P. Wilson  
 Surveying instrument.....J. Harman  
 Suspender end clasp.....E. E. Stuver  
 Switch operating mechanism.....T. Rundorff  
 Table locking device, Pedestal.....C. Wilhelm  
 Tag holder.....J. B. Rose  
 Tallow, &c. Decomposing.....F. Perrelet et al  
 Tank filling apparatus, Combined automatic signal and cut off for.....W. Renner  
 Tape fastener.....W. C. Martineau  
 Telephone circuits and apparatus, Means for protecting.....A. B. Stetson  
 Telephone receiver.....W. W. Dean  
 Telephone selecting device.....B. Hamilton  
 Telephone switchboards, Busy test apparatus for.....J. J. O'Connell  
 Telephone wire noise and lightning arrester.....A. Stiles  
 Telegraph system.....H. Bentz  
 Tennis court marker.....J. H. Bullard  
 Therapeutic apparatus.....G. L. Abell  
 Thread dressing machine.....G. A. Fredenburgh  
 Threshing machine conveyer attachment.....J. H. Hissong  
 Ticker attachment.....R. D. Westeote  
 Ticket or card holder.....A. L. Johnson  
 Tickets, labels, or the like, Holder for rolls of.....C. Grundig  
 Tile mold.....R. C. Tucker  
 Tinning baths, Compound for use in.....A. W. Burwell  
 Tire, Sectional cushion.....C. Miller  
 Tire smoothing device, Rubber.....A. E. Ellinwood  
 Tool, Combination.....C. E. Waters  
 Tool, Hand.....A. Vanderbeek  
 Tool heater.....H. Walther  
 Tools, Variable speed drive for machine or other.....W. Donaldson  
 Track gage and bridle, Combined.....F. H. Hicks  
 Track or rail.....F. H. F. Keil  
 Track raising implement.....J. J. Buckley  
 Track, Revolving circular.....W. P. Dameron  
 Train stop, Automatic.....C. F. Miller  
 Transplanter.....C. Hering  
 Tripods, Sliding joint for camera.....F. B. Case  
 Truck bolster, Railway car.....J. M. Hansen  
 Truck, Four wheel swing fulcrum.....B. R. Van Kirk  
 Truck, Freight car.....J. H. Graham  
 Truck side bearing, Railway car.....H. W. Fowler  
 Tubular articles, Manufacture of.....G. G. & R. O. Blakey  
 Tunnel construction, Apparatus for facilitating.....J. A. Davies  
 Turbine, Steam.....T. G. E. Lindmark  
 Typewriter.....C. Wasmuth

Type writing machine indicating device.....F. X. Wagner  
 Umbrella.....J. Clegg  
 Umbrella.....G. Kaltenecker  
 Valve.....L. N. Davis  
 Valve.....W. Cooper  
 Valve and implement for attaching same, Detachable.....R. W. Sampson  
 Valve, Drain.....C. A. Dunham  
 Valve, Equalizing and by pass.....E. Sarver  
 Valve mechanism, Fluid pressure engine.....M. N. Forney  
 Valve, Stock watering tank.....P. Tiffany  
 Vapor burner.....E. W. Pritchard  
 Vehicle.....A. L. Prescott  
 Vehicle brake mechanism.....F. B. Townsend  
 Vehicle driving gear.....M. W. Talen et al  
 Vehicle, Motor.....H. Vanderbeek  
 Vehicle shifting rail.....W. B. Fletcher  
 Vehicle steering mechanism, Motor.....T. W. Barber  
 Vehicle wheel.....E. H. Phipps  
 Vending machine.....J. Jonson  
 Vent controller.....A. G. Powers  
 Ventilating apparatus.....J. S. Roake  
 Vermin exterminator.....S. W. & S. R. Macy  
 Vulcanization.....W. H. Roberts  
 Wagon box or hay rack lifter.....L. Paul  
 Wagon, Dump.....H. S. Hoy  
 Washboard.....J. Opp  
 Watch regulator.....R. Lange  
 Watch, Stem winding and setting.....E. Kuhn  
 Water closet covers, Mechanism for temporarily locking.....E. Woodruff  
 Water purification apparatus.....S. S. Pridham  
 Weather strip.....W. A. Scott  
 Weather strip, Door.....C. E. Meeker  
 Weed cutting machine.....J. C. Walter  
 Weighing machine, Automatic.....G. Hoepner  
 Well borer.....R. E. Brown  
 Well drilling apparatus.....H. Kelly  
 Well drilling machine I. S. & D. S. Ausherman  
 Well drilling machine.....R. D. Patterson  
 Well reamer, Deep.....P. Higgins  
 Well strainers, Means for clearing.....M. J. Clark  
 Wheel balance, Apparatus for testing.....C. J. A. Heise  
 Wheel tempering apparatus.....A. F. Howe  
 Window.....J. H. McIlroy  
 Window cleaner's safety support.....reissue.....H. K. Whitner  
 Window platform.....W. S. Sherwood  
 Window screen.....W. C. Hering  
 Wire, Covering.....R. Varley  
 Wire fabric making machine.....G. Langer  
 Wrench.....C. C. English  
 Wrench.....D. E. Painter  
 X-ray tube.....R. Friedlander  
 Yoke attachment, Neck.....S. Pearson  
 Yoke counter stop for artillery carriages, Neck.....F. Wenke  
 Yoke, Neck.....R. Jones  
 Zinc or other ores, Treatment of.....W. B. Middleton  
 Zinc ores, Manufacturing spelter from.....O. H. Picher  
 Zinc ores, Treating.....C. V. Petraeus  
 Zinc ores, Treatment of.....C. V. Petraeus  
 Zinc oxides, Smelting.....C. V. Petraeus  
 Zinc, &c. Treatment of ores containing.....C. V. Petraeus

## DESIGNS.

Bottle.....J. Alland  
 Boxes, &c. Cover for puff.....T. W. Foster  
 Brooch, button, or buckle plate, &c.....S. A. Keller  
 Brushes, &c. Back for hair.....T. W. Foster  
 Brushes, mirrors, &c. Back for.....L. C. Hiller  
 Buckle, Belt.....2 pats.....L. L. Prahar  
 Button hooks, &c. Handle for.....T. W. Foster  
 Dishes, Mount for.....R. R. Kintz  
 Finger ring.....G. H. North  
 Stove.....W. L. Mersfelder

Issued August 18, 1903.

## MECHANICAL PATENTS.

Acid in natural phosphates soluble in citric acid, Rendering the phosphoric.....G. Hoyermann  
 Acids, Apparatus for condensing and mixing.....F. I. du Pont  
 Air brake systems, Device for heating.....J. W. Geary  
 Alloys directly from ores, Making nickel iron.....N. V. Hybinette  
 Anticorrosive composition.....A. P. Cuthrie  
 Antifouling composition.....A. P. Cuthrie  
 Arcs, Disrupting.....F. E. Case  
 Arm rest.....G. Smith  
 Armature coil.....F. A. Merrick  
 Ash can.....J. W. M. Hipwell  
 Astrakhan, Imitation.....M. Lewin  
 Axes, hatchets, or the like, Making.....A. Schmidt  
 Axle lubricator, Car.....2 pats.....C. R. Claghorn  
 Baby jumper.....M. B. Davidson  
 Baling press.....J. T. W. R. & G. B. Rodgers  
 Baling press automatic folder or tucker.....P. & L. Trabe  
 Balustrade.....K. T. Horn  
 Barrel or keg.....S. J. Edmiston  
 Bearing, Center.....J. E. Norwood  
 Bed slat fastener.....A. N. Webb  
 Bedstead fastening.....W. S. Walker  
 Bell indicator attachment.....C. E. Monroe  
 Belt supporting device.....F. R. Wilson, Jr  
 Bending machine.....2 pats.....C. F. Hinn  
 Benzoin pan.....C. E. Howard et al  
 Binder.....W. E. Blackburn et al  
 Binder, Loose leaf.....E. T. A. Akass  
 Blackboard.....A. E. A. Opitz  
 Blast furnace.....G. W. Bollman  
 Blast furnace.....J. C. Cromwell  
 Blind stop.....C. L. Koenig  
 Boat, Life.....A. Lasserre  
 Boat, Folding.....I. O. Perring  
 Bobbin holder.....T. J. Murdock  
 Boiler.....W. D. Boyce  
 Book, Check.....M. P. Exline  
 Book rack, Pass.....M. J. Robinson  
 Bottle mouth dust protector.....M. Haas  
 Bottle, Non refillable.....W. S. Palmer  
 Bottle stopper.....E. A. Nugent  
 Bottle stopper.....G. West  
 Bottle washing and rinsing machine.....C. C. Parker

Bottles, Machine for producing glass.....T. C. Duffield  
 Box filling machine.....W. H. Wyman  
 Braiding machine.....J. Lundgren  
 Brake shoe.....T. M. Bell  
 Brakes, Operating electric.....F. E. Case  
 Brick kiln.....C. Cebulla  
 Brine cooler.....A. H. Hutchinson  
 Brooder.....I. Morrow  
 Broom holder.....G. M. Eidt  
 Brush appliance, Tooth.....C. R. Lane  
 Bucket, Clam shell.....2 pats.....J. C. Slocum  
 Buffing head.....F. J. Kane  
 Buggy attachment.....C. Brown  
 Buoy, Body indicating.....H. Condren  
 Bushing expander.....G. Staiger  
 Buttonhole cutting and stitching machine.....E. B. Allen  
 Cabinet, Kitchen.....L. Hockman  
 Cameras, Focusing view finder for photographic.....E. H. Williamson, Jr  
 Can filling machine.....P. Mitchell  
 Car brake, Beamless.....J. S. Cary  
 Car coupling, Automatic.....O. C. Moore  
 Car couplings, Flexible joint for.....G. E. Tomlinson  
 Car door.....W. T. Spillane  
 Car draw gear, Railway.....2 pats.....J. F. Courson  
 Car, Mine.....T. Staggy  
 Car, Railway.....W. S. Glover  
 Car stop.....2 pats.....C. R. Claghorn  
 Car underframing, Railway.....G. I. King  
 Car unloading apparatus.....C. R. Claghorn  
 Cars, Apparatus for controlling the working of electrically driven.....A. Siemens  
 Cars, Car strap for street.....J. S. Navarro  
 Carboating apparatus.....2 pats.....H. A. Hopkins  
 Carpet cutting machine.....J. Silberstein  
 Carpet stretcher and tacker.....J. W. Quilling  
 Carriage seat, Folding.....J. Broenen  
 Casing spear.....E. C. Wilson  
 Caskets over the boxes, Device for carrying.....G. H. Fuller  
 Casting mold, Chain.....J. Bone et al  
 Casting solid metallic bodies.....B. A. Mick  
 Centrifugal machine electric driving apparatus.....L. Hirt  
 Chain.....F. R. Willson, Jr  
 Chair.....G. A. Dutton  
 Chair.....D. R. Cotner  
 Check hook and rein piece.....T. L. Cooper  
 Chimney top and ventilator.....J. F. Le Beau  
 Cigar case.....O. L. Parmenter  
 Cigar case.....O. L. Parmenter  
 Cigarettes or like goods, Machine for packing.....A. Godfrey  
 Circuit breaker.....T. E. Daniels, Jr  
 Circuit breaker for jump spark coils.....A. H. Deisher  
 Clipper, Hair.....W. J. Long  
 Clothes dryer.....W. A. Kester  
 Clothes drying apparatus.....D. P. Prescott  
 Clothes stick or lifter.....2 pats.....T. F. Condon  
 Clothes washer.....S. A. Newcomer  
 Clover buncher.....J. K. Sharpe, Jr  
 Clutch.....C. L. Grohmann  
 Clutch, Electromagnetic friction.....W. Schuster et al  
 Coat.....M. Wenzel  
 Coffee, Treating.....W. E. Baker  
 Concrete and metal construction.....J. Kahn  
 Conveyor.....F. R. Willson, Jr  
 Conveying apparatus, 2 pats.....F. R. Willson, Jr  
 Copy holder.....A. J. Harpole  
 Core making machine.....W. M. McCallum  
 Corn husker ear agitating guide.....J. V. Ross  
 Corn sheller.....A. R. Montgomery  
 Corn shocker.....P. C. Knutson  
 Cornet.....H. C. Martin  
 Crank and crank connection.....T. L. & T. J. Sturtevant  
 Cream separator.....H. D. Zehrbach  
 Cultivator.....H. M. Phillips  
 Curtain bracket, Adjustable.....G. W. Wiggins et al  
 Curtain clasp and holder, Window.....R. F. Murray  
 Curtain fixture, Window.....C. E. Heurichy  
 Curtain pole socket.....W. B. McCarthy  
 Cut off and self cleaning filter, Automatic system.....A. B. B. Harris  
 Cut out.....W. M. Hall et al  
 Cycle safety apparatus.....A. Kuhn  
 Dampening and ironing machine, Combined.....T. S. Wiles  
 Dampening machine.....T. S. Wiles  
 Damper regulator, Electric.....A. M. Butz  
 Demijohns or similar receptacles, Covering for.....G. Porta  
 Developing photographic pictures.....F. Fischer et al  
 Disk drill, Double.....W. A. Dynes et al  
 Disk drill, Single.....J. M. Pierce  
 Display rack, Curtain.....J. A. Gemmill  
 Ditching machine.....F. J. Beckley  
 Dock, Floating.....H. F. Hansson  
 Dock, Floating.....H. Flyander  
 Door check.....J. F. Scott  
 Door check and closer, Combined.....R. C. Hills et al  
 Door, Combined screen and storm.....L. J. R. De Vries  
 Door hanger, Sliding.....J. A. Einfelt  
 Door mat.....H. J. H. Bruhn  
 Door opener and holder.....J. D. Gendron  
 Doors, Overhead track covering for outside.....J. E. Whitacre  
 Draft and buffing mechanism.....P. T. Handiges  
 Draw bench.....G. B. Lamb et al  
 Drawing press.....F. C. B. Page  
 Drill press attachment.....H. N. Huckleby  
 Driving mechanism.....C. Stollwerck  
 Dye and making same, Blue sulfur.....R. Gley  
 Dye and making same, Indigo blue sulfur.....O. Kaltwasser  
 Easel, Sketching.....S. H. Esbjorn  
 Eccentrics, Adjustable strap for.....W. Harling  
 Educational material.....W. Seegmiller  
 Electric brake.....F. E. Case  
 Electric cable.....K. T. Bennet et al  
 Electric furnace or oven.....A. Eimer  
 Electric machinery, Dynamo.....H. Chitty  
 Electric machine, Field winding.....E. Ziehl  
 Electric motor and brake.....A. A. Threshers  
 Electric motor controller.....W. H. Chapman  
 Electric operating apparatus, Means for controlling.....K. Hertwig  
 Electric sectional furnace.....A. Eimer  
 Electric switch.....W. M. Scott  
 Electric transmission system.....R. A. Ripley  
 Electric trip mechanism.....C. C. Ely et al



- Elevator shaft safety guard.....W. Sheridan  
Embroidery machine.....F. P. Ledreux  
Engine.....J. J. E. Phillips  
Engine sparking igniter, Explosive.....  
Engines, Balanced piston for steam D. E. Rice  
Engines, Electric igniter for internal combustion.....L. Jones  
Engraving machine, Three dimension M. Barr  
Envelop.....P. E. Johansen  
Fan, Fly.....F. R. Womeldorf  
Fare register operating device.....B. B. Moad  
Feed mechanism, Automatic M. C. White et al  
Feeder, Boiler.....H. J. Davis et al  
Feeding apparatus, Shell head.....F. W. Olin  
Fence machine, Wire.....G. W. Whittington  
File attachment, Binding.....E. T. A. Akass  
File, Binding.....2 pats.....E. T. A. Akass  
File, Document.....B. R. Porter  
Filter, Barrel.....C. D. Grove  
Filters, Cleaning.....T. J. Zoeller  
Fire alarm, Electric.....G. B. Martin  
Fire box sheet.....J. Conroy  
Fire escape.....M. O. Barke  
Fire extinguisher, Automatic.....E. G. Gay  
Fire protecting door for air or elevator shafts.....H. Fischer  
Fire shovel.....H. C. Stiefel  
Fish line reel.....E. D. Rockwell  
Floor scraper.....E. Goulette  
Flue cap.....J. McIntyre  
Flushing apparatus.....F. N. Dixon  
Fly trap.....E. F. Davison  
Fodder shredder cleaning device.....C. E. Curtis  
Folding box.....M. Hirsch  
Folding case.....J. O'Brien  
Formaldehyde compound.....R. Lepetit  
Foundations and tunnels or other structures, Constructing.....C. SooySmith  
Fruit drier.....G. W. Henkle  
Fruit picker.....M. Aksila  
Furnace.....J. E. Langford  
Furnace air and steam feeding attachment, Boiler.....G. Marlow, Sr  
Furnace bell gear, Blast, J. C. Cromwell et al  
Furnace charging car, Blast, G. W. Bollman  
Furnace grate bars, Apparatus for shaking.....J. A. F. E. & M. E. Normand  
Garment.....W. G. Turner  
Garment fastener.....H. Booth  
Garment supporter.....H. T. Vaders  
Gas engine, Direct acting.....P. Gervais  
Gas generator, Acetylene.....J. M. & P. M. Flugstad  
Gas generator, Water.....C. H. Schill et al  
Gas tip.....W. Kramer  
Gas valve water seat.....E. Bumford  
Gate attachment, Automatic.....F. H. Warne  
Gear, Changeable speed.....W. L. Marr  
Gearing, Variable speed.....F. L. Todd  
Girder, &c. Concrete and iron.....R. Grimm  
Glass mold.....A. B. Scott  
Glazier's tool.....L. J. Klemm  
Gold washing machine.....T. F. Turner et al  
Goods holding and displaying device.....G. W. Boyd  
Governor.....G. B. Petsche  
Governor, Marine engine.....I. Cornelissen  
Grain bagging and weighing machine.....J. B. Williams  
Grain drill gearing.....C. H. Pelton  
Grain separator.....P. Eagen  
Graphite, Purifying.....M. F. R. Glogner  
Grinder Tool.....R. C. Greener  
Grinding machine tool holder.....J. Bath  
Grinding mill.....F. E. Whitham  
Guiding systems, Apparatus for ascertaining position relative to prearranged R. B. Owens  
Gun, Field.....E. K. Rothe  
Hams and trace hook.....J. B. Gathright  
Hammer.....G. J. Steele  
Hammer or hatchet, Magazine.....F. S. Vogue  
Harness hanger.....J. Reichert  
Harvester, Corn.....2 pats.....G. D. Foster  
Harvesting or husking machines, Snapping rolls for corn.....B. R. Benjamin  
Hat and coat rack.....E. Pratt  
Hat, coat, and umbrella holder.....P. Hufeland  
Hat rack or hanger.....J. G. White  
Hatch.....H. Brousseau  
Hay rake, stacker, and loader J. A. & O. Smith  
Head rest.....W. N. Greer  
Hens from setting, Means for preventing.....J. B. Copeland  
Hive frames, Foundation fastener for.....O. O. Bordson  
Hoisting machine.....W. A. Barker  
Holder.....F. W. Matson  
Hooks and eyes, Carrier for machines for carding.....J. W. Granger  
Horses or other animals on shipboard or other places, Apparatus for exercising N. Burgess  
Hose coupling.....C. Wright  
Hose supporter.....C. E. Schaffner  
Hot air registers, Vaporizing device for.....L. C. Wilcox  
Ice cream cabinet.....H. A. Hopkins  
Ice cream freezer.....C. R. Hamilton  
Ice spur.....L. Winterhalter  
Imitating apparatus.....E. & U. S. DeMoulin  
Internal combustion engine.....C. A. Wilkinson  
Jack-o'-lantern, Folding.....J. J. Du Ket  
Jars, Tools for removing screw caps from.....F. L. Stork  
Journal bearing.....I. Metzger  
Knee pad, Scrub woman's.....W. Steers, Sr  
Labeling machine.....J. T. Reames  
Ladder, Foldable fruit.....S. S. Ward  
Ladder, Metallic step.....W. H. Cloud  
Lamp, Alcohol.....J. P. Stepp  
Lamp burner, Flat wick.....W. C. Quigley  
Lamp, Gas.....T. Brabson  
Lamp socket.....W. A. Church  
Lamp support.....S. Camins  
Lamps, Automatic apparatus for extinguishing.....P. E. Newson  
Lantern holder and protector.....G. F. Kibling  
Latch, Automatic.....M. N. Drucker et al  
Lathe.....C. E. Search et al  
Lathe, Turret.....C. E. Search et al  
Ledger and compressor, Loose leaf.....E. T. A. Akass  
Legging fastening.....L. H. Morgan  
Lime and gas, Manufacture of, J. J. McTighe  
Linoleum, Machinery for manufacturing patterned.....P. Blaubach  
Liquid delivery case and cooler.....C. E. Flinder  
Liquid fuel burner automatic regulator.....A. C. Stewart  
Loading device.....W. E. Hamilton  
Loading machine.....W. E. Hamilton  
Lock.....G. Lenhard  
Loom or frame for beadwork.....T. F. Damm  
Loom pattern chain.....J. T. Cyr  
Loom reed.....G. de Zorawski  
Loom shuttle.....J. Coldwell et al  
Loom shuttle automatic threading device.....R. L. Cummock  
Looms, Machine for soldering leads for weaving.....J. Gohy  
Lubricating device, Bearing.....J. D. Forrer  
Mail receptacle.....J. P. Brown  
Mailing tube.....J. C. Kimsey  
Mathematical device.....S. N. Betts  
Measuring tape.....F. Buck  
Merry-go-round.....J. M. Sherman  
Metal cutting machine.....J. H. Doub  
Metal shearing machine.....C. P. McDonner  
Metal working tool.....A. Tindel  
Metals, Dry separator for.....T. M. Moe  
Metallic fabric.....2 pats.....R. S. Brown  
Metallic tie and rail fastening V. A. Showalter  
Milk jar closure.....J. Crane, Jr  
Milling machine.....C. P. Higgins  
Minerals, Locating.....G. I. Leonard  
Mining machine.....H. B. Dierdorff  
Mirror, Rear view hat.....L. D. Merrick  
Mirror support, Adjustable.....C. N. Langdon  
Miter box.....A. P. Forsling  
Mixing and washing machine.....T. Haskins  
Molding machine.....E. A. Goepper  
Motor control system, Electric G. S. Dunn et al  
Motors from a distance, Electrically controlling.....W. Baxter, Jr  
Mower knife head.....L. B. Mitchell  
Multivoltage system.....C. E. Woods  
Music playing instruments, Accentuation mechanism for antipneumatic N. D. Hosley et al  
Music roll perforating device.....H. P. Ball  
Nailing machines, Reel for holding wire in.....S. M. Cutter  
Nut lock.....C. F. Strohmeier et al  
Nut, Looking.....M. E. Donally  
Oil burner.....E. M. Arnold  
Oil burner.....T. Williams  
Oil burner nozzle.....H. E. Brunner et al  
Oil can acoustic alarm.....J. A. Pollock  
Ore dumping apparatus.....N. A. H. Salomonson  
Osmose apparatus.....J. L. Kubin  
Package carrier.....2 pats.....E. F. Priddat  
Package fastener and carrier.....E. F. Priddat  
Package safety holder.....E. M. Reed  
Package tie fastener.....F. M. Crawford  
Paper bag machine.....P. L. Bartholomew  
Paper blank cutting mechanism.....J. E. Robinson et al  
Paper cartons, Machine for lining.....L. G. Reynolds  
Paper cord making machine.....H. B. Morris  
Paper making machine.....J. Groudhall  
Paper perforator.....W. S. Meendenhall  
Paper roll adapted to be cut into blanks.....J. E. Robinson et al  
Parachute, Dart.....R. W. Means  
Peat digging and conveying machine.....C. F. Schlickeysen  
Pen, Fountain.....W. I. Ferris  
Pen and pencil receptacle tablet, Combination.....W. H. Wyman  
Petroleum, Deodorizing or purifying F. Berg  
Petroleum deodorizing or purifying apparatus.....F. Berg  
Photographic tray.....G. T. McKinney  
Piano action flange.....G. M. Guild  
Piano pedal action.....R. M. Bent  
Piano tuning pin cover.....I. B. Rosencrantz  
Picker staff and shuttle check, Combined.....2 pats.....J. Coldwell et al  
Pile driver.....N. Simonson  
Pin.....M. Rhoades  
Pipe wrench.....A. Fassenmeyer  
Pipes, Clamp or device for stopping leaks in.....D. T. Pitkethly et al  
Piston.....J. C. Junkin  
Piston rods, Bearing for steam feed.....H. G. Dittbenner  
Pitman.....T. L. & T. J. Sturtevant  
Planter and fertilizer distributor, Seed.....J. A. McCutchen  
Plow.....C. R. Davis  
Plow jointer or rolling colter.....W. R. Criffield  
Plow point.....J. Halman  
Plow, Sulky.....G. Wilkinson  
Pneumatic tube.....L. G. Bostedo  
Pocket knife.....2 pats.....E. Kaufmann  
Pole socket, Vehicle.....H. E. Martin  
Pool ball registering triangle.....E. J. Wells  
Port light.....C. F. Petersen  
Portable elevator and dump.....J. & D. Fisher  
Post hole forming implement.....H. D. Sorg  
Powder puff.....J. F. Rowland et al  
Printing.....C. Owens  
Printing press perforating attachment.....N. A. Emrich et al  
Pruning shears.....E. Mohr  
Pump.....E. T. Miles et al  
Pump, Air.....L. E. Hoffman  
Pump, Air.....W. M. Reason  
Pump bail, Sand.....R. Crytser  
Pump stroke regulator, Windmill.....N. S. Lowrie et al  
Pumping device.....F. L. Robertson  
Pumping engine.....C. J. Printz  
Pushing apparatus, Strip.....A. Pollak  
Puzzle.....D. McPherson  
Quartz mill.....C. J. Hodge  
Rail joint.....W. C. Scofield  
Railway or tramway vehicles, Brake apparatus for electric.....J. G. V. Lang  
Railway rail and rail joint.....J. Teller  
Railway signal.....J. G. Schreuder  
Railway signal, Automatically operated.....I. Reyneet  
Railway signal, Electric H. A. Ammann et al  
Railway switch.....F. W. Aley  
Railway system, Electric.....T. Mahoney  
Railway vehicles, Reversing apparatus for use on.....J. Graber  
Rake.....K. Ries  
Range finder, Electrical.....H. Shoemaker  
Razor guard.....J. J. Meehan  
Reach and short turning gear, Interchangeable.....F. C. Kerby  
Receptacle.....C. O. Harker  
Receptacle for corned beef, &c.....W. G. Bell  
Recording device.....J. A. Cole  
Refrigerator drawer.....A. L. Shanklin et al  
Resistance tube.....C. Bloom  
Roasting pan.....E. H. Moore  
Rock drill.....C. Mead  
Rotary engine.....J. Graves  
Rotary engine.....R. B. Morden  
Rotary explosive engine.....J. J. O. R. Rulianich  
Rubber heel.....F. M. J. S. & W. W. Hilton  
Rule, Protractor.....A. Peterson  
Sack holder.....J. Schmidt  
Said iron.....C. W. Johnston  
Saddle, Harness.....C. W. Miller  
Sash fastener.....E. H. Baker  
Sash, Store front.....J. B. Phelps  
Sausage stuffing machine.....E. Hahn  
Saw set.....J. Morin  
Saw set and gage, Combined.....D. Worden  
Scalper, grader, and purifier.....A. Craig et al  
Scow, Dumping.....B. Seaman  
Screw nail.....T. R. Hitchman  
Seal, Snap.....E. J. Brooks  
Seat support.....G. Wilson  
Secondary battery.....G. E. Hatch  
Secondary battery.....J. Middleby, Jr  
Sewing machine.....G. H. Dimond  
Shade and curtain support, Combined C. S. Snel  
Shade, Artificial light.....O. A. Mygatt  
Shade bracket, Adjustable M. H. Middlemiss  
Shade roller.....W. Mumbrauer  
Shaft and harness support.....F. D. Davies  
Shaft support.....E. R. Edson  
Shafting, Flexible.....G. E. Gay  
Sharpener, Disk.....J. S. Donnell  
Shoe fastening.....E. L. Knapp  
Sign, Illuminated.....W. M. Hall  
Signaling, Electrical.....H. Shoemaker et al  
Signature bundling machine.....S. H. Pray  
Skirt.....S. H. Camp  
Sleigh.....W. C. Pierce  
Snow boat.....S. S. Hansen  
Soap press.....C. Drolet  
Soap wrapping machine.....J. E. Robinson  
Soldier.....R. Bormann  
Soldier for aluminium.....R. Fortun et al  
Sound producing device suitable for sirens or like instruments.....J. P. Northey  
Sound record cylinders Forming metal matrices for duplicating.....A. N. Petit  
Spanner or wrench.....J. Chandler  
Spinning spindle.....J. C. Potter  
Spinning spindle bolster and step combined.....J. Caldwell  
Spool holder.....C. T. Starr  
Sprocket wheel.....F. R. Willson, Jr  
Stacker, Straw.....A. M. Hood  
Starching machine.....J. Huebsch  
Steam boiler.....M. O'Connor  
Steam boiler.....H. L. Fulewider  
Steam drier.....C. H. Noyes  
Steam engine.....W. M. Smith  
Steam generator.....V. Taboulevitch  
Steam generator water gage.....A. Wood  
Steam generator, Water tube.....H. W. Kelle  
Steam power apparatus.....P. L. Clark  
Steam power plants, Operating.....P. L. Clark  
Steam trap.....F. W. Leuthesser  
Steam trap.....T. J. Grace  
Steel, &c. Apparatus for making.....E. C. Wills  
Stool, Foot.....R. M. Nideier  
Store service apparatus.....M. C. Swezey  
Stove.....G. J. Day  
Stove attachment.....M. J. Stevens  
Stove cover and lifter.....L. T. Lenderking  
Stove, Gas heating.....E. Meinlughaus  
Stove, Heating.....C. J. Kirch  
Stovepipe holder.....W. H. Medina  
Submerged devices, Means for protecting.....O. A. Stempel  
Sucker rod connector.....F. M. Egbert  
Sugar mixing apparatus.....J. Ragot et al  
Sugar Press for pressing the parings of diffusion chambers in the manufacture of W. Bock  
Sulfuric anhydride, Making.....E. Raynaud et al  
Sun shield.....R. L. Morgan  
Superheating apparatus.....M. W. Sewall  
Surgical ecraseur.....L. R. Kratzmuller  
Tag stringing machine.....J. C. Kimsey  
Tank.....A. Holtgen  
Tank heating apparatus.....E. O. Whittington  
Tank mold.....J. C. Dougherty  
Telegraph signals, Determining the direction of space.....reissue.....J. S. Stone  
Telegraphic transmitting and receiving apparatus.....G. F. R. Blochmann  
Telephone.....J. A. Barrett et al  
Telephone apparatus.....C. G. Burke  
Telephone paper holding device W. H. Sherman  
Telescopic sights, Means for adjusting cross hairs of.....A. W. Peterson  
Tie.....E. F. Priddat  
Tie fastener.....reissue.....E. F. Priddat  
Tie fastener.....E. F. Priddat  
Tile and roof, Roofing.....J. Veen  
Tire.....W. P. Scofield  
Tire, Pneumatic.....P. W. Litchfield  
Tire, Pneumatic.....W. Corliss  
Tobacco pipe attachment.....T. C. Martin  
Tongs.....M. Quinn  
Tool, Combination.....J. Parbel  
Tool, Pneumatic.....C. H. Shaw  
Tooth cleaning appliance.....J. E. Storms, Jr  
Toy, Whistling.....C. D. Robb  
Track sanding device.....J. H. Watters  
Train control system.....F. E. Case  
Trains, Device for delivering messages to moving.....A. U. Campbell  
Transparency.....J. Lobmiller  
Transport of materials, Apparatus for.....H. Marcus  
Trimming making machine.....J. A. Groebli  
Trolley.....L. Lavagne et al  
Trolley.....T. P. Seastrunk et al  
Trolley.....E. Hall  
Trolley.....A. P. Lord  
Trolley catch.....M. C. White et al  
Trousers hanger.....J. Nagely  
Truck.....J. P. Lind  
Truss.....M. B. Brooks  
Tube making fagot.....W. Allderice  
Tunnel section.....H. F. Dunham  
Type expander.....J. J. Cain  
Type writer.....W. Baxter, Jr  
Type writer type bar.....J. A. Smith  
Type writing machine.....R. D. Stackpole  
Umbrella support.....W. M. Feazell  
Valve gear for compound locomotive engines.....W. M. Smith  
Valve, Pipe line.....C. E. Fowler  
Valve, Pop safety.....J. Collis  
Vehicle driving gear, Motor.....E. E. Wright  
Vehicle driving mechanism.....P. Synnestvedt  
Vehicle heating apparatus.....A. F. Ray  
Vehicle lantern holder.....G. F. Kibling  
Vehicle, Motor propelled.....J. Munden  
Vehicle reservoir, Motor.....F. Charron et al  
Vehicle runner, Wheeled S. J. & J. D. Phillips  
Velocipede frame.....E. G. Latta  
Vehicle wheels, Antiskidding device for.....S. Butler  
Voting machine.....C. E. Turner et al  
Wagon running gear.....J. E. Bennett  
Wall construction.....W. H. Fisher  
Washing machine.....M. J. Lawler  
Washing machine.....F. E. Waldbey  
Washstand, Cabinet.....J. B. Wheatley  
Watchcase.....A. Bilat  
Watch fob.....W. H. Lamb  
Watch protector.....C. R. Tetzner  
Water by electrolysis, Decomposing.....W. F. M. McCarty  
Water closets or other structures, Flushing tank for.....W. U. Griffiths  
Water controlling device.....E. J. Markel  
Water gage.....M. Hering  
Water heater.....W. E. Vanstone  
Water, Purifying.....J. E. C. I. Putzeys  
Water repellent, Machine for treating fabrics for rendering them.....C. Lichtenstadt  
Water trap for waste pipes.....F. B. Charron  
Water tube boiler.....G. Silvestri  
Weather strip.....J. W. Henry  
Well drilling machinery.....G. A. Gilborne  
Wheels and pulleys, Manufacture of.....E. Roemer  
Wheelbarrow.....E. M. Cummins  
Winding machine.....C. Anderson  
Winding mechanism, Ball.....F. W. Worrell  
Window sill.....C. L. Edmonds  
Wire stretcher clamp.....R. Socks et al  
Wood preservative.....H. W. Gander  
Woodworking tool.....J. J. Blandford et al  
Worsted box.....G. M. Wooster  
Woven fabric and producing same.....W. Rumpf  
Wrench.....J. G. Campbell  
Yeast, Preparation of.....G. Jacquemin  
Yeast, Preparing.....G. Jacquemin  
Zinc from its ores, Extracting.....C. G. P. de Laval  
Zincing objects by electrolysis.....I. Szirmay

## DESIGNS.

- Automobile body.....L. B. Gaylor  
Badge.....K. Melrose  
Badge or similar article.....R. M. Crawford  
Braid.....C. Schwarz  
Candelabrum.....A. H. Heisey  
Desk and seat support or standard.....J. Dux  
Doily or similar article.....2 pats.....J. W. Catty  
Fabric, Decorative.....H. Giebel  
Lighting fixture shell, 4 pats.....H. E. Watkins  
Plate, dish, or similar article.....C. E. Haviland  
Radiators.....E. V. Seeler  
Spoons, forks, or similar articles, Handle for.....W. R. Stocking  
Spoons or similar articles, Handle for.....E. Cress et al  
Table cloth.....J. A. Steinau  
Watch charm or similar article F. L. Schmalz

Issued August 25, 1903.

## MECHANICAL PATENTS.

- Abrading machine.....L. Peterson  
Acid, Absorber for the manufacture of sulfuric.....J. B. F. Herreshoff  
Acid, Obtaining pure pyrolytic.....G. Glock  
Acids, Mechanism for reducing pyrolytic.....W. S. Brandt  
Advertising device, Electric.....J. C. Currah et al  
Air brake operating device, Automatic.....A. H. Freeman  
Amusement apparatus.....C. C. Eggers  
Amusement device.....W. A. Wright  
Anchor, Earth.....G. H. Miller  
Antifreezing closet.....J. Moloney, Jr  
Artesian or oil drilling machine.....D. A. Messner  
Automatic elevator.....W. H. Hultgren  
Automobile controlling device.....C. B. Groat  
Automobile hood.....J. Pichl  
Awning and window shade, Combined.....W. E. Messacar  
Baby jumper.....T. M. Vaughan  
Baking pan.....J. K. Zeininger  
Baling press.....I. R. Choat  
Baling press.....J. J. Stopple  
Baling press.....W. C. Spurgeon  
Band cutter.....W. Weidman  
Battery element.....C. B. Schoenmehl  
Battery grids, Machine for making.....T. J. Coster  
Bearing, Convolute pressure.....R. C. Sayer  
Bed spring.....N. Rubenstein  
Bell ringer.....I. W. Bragg  
Beveling machine.....T. F. Hutton  
Beveling machine.....C. L. Goehring et al  
Bicycle.....A. F. Price  
Bicycle frames, Runner attachment for.....F. Dupras  
Billiard cue chalker.....W. E. Guese  
Binder, Loose leaf.....C. R. Nelson  
Binder, Loose leaf.....J. R. Barrett  
Binder, Transfer.....E. A. Trussell  
Bit.....W. C. Moorhead  
Blind fastener.....E. Favrean  
Blind operating device, Window.....A. C. Price et al  
Bobbin holder.....S. W. Wardwell  
Boiler.....L. Grenthe  
Boiler.....F. E. Stanley  
Boiler flue roller.....J. Ulrich  
Boiler furnace, Steam.....E. J. Wood  
Boiler tube extractor.....J. W. Matthews  
Bolster.....2 pats.....W. H. Scott  
Bolster, Trussed.....W. H. Scott  
Bolt blanks, rivets, rods, &c. Apparatus for heating.....W. W. Mulford et al  
Bolt clipper.....G. Binder  
Bolts to slabs, Means for securing.....E. J. Blakesley  
Book, Carbon copy letter.....G. Spence  
Book, Index memorandum, C. H. Heeley et al  
Books, Leaf for loose leaf.....H. C. Miller  
Bookbinder.....W. Feldmann  
Boom fastening device.....T. S. Laughlin  
Boot or shoe.....J. E. Jackson  
Boot or shoe form or last.....J. E. Bete  
Bottle cap.....A. J. Martin  
Bottle cleaning machine.....A. F. Cramer  
Bottle filler, Siphon.....C. M. Earl  
Bottle, Non-refillable.....J. L. Prior  
Bottle, Non-refillable.....D. W. Turk  
Bottle, Non-refillable, C. R. Schumacher et al  
Bottle registering attachment.....M. S. Simon



Bottle soaking machine..... T. J. Barry et al  
 Bottle stopper..... S. H. Rogers  
 Bottle washing machine..... A. L. Rosmann et al  
 Box fastener..... C. M. Johnson  
 Boxing articles. Apparatus for..... H. Sevene et al  
 Bracelet..... S. O. Bigney  
 Brake..... G. E. Moffett  
 Brake shoe. Railway..... B. Willhide  
 Brewery construction..... A. L. Neubert et al  
 Bridge construction..... W. F. Walker  
 Broom filling machine. Circular..... W. Frauz  
 Broom holder..... C. N. Pollock  
 Brush. Fountain..... C. Plathner  
 Bucket..... G. McElhany  
 Buckle. Cross line..... J. McCrossin  
 Buckle. Slide..... R. E. Neal  
 Bushing for split pulleys..... C. H. Bicalky  
 Button..... C. W. Garis  
 Cable laying device. Submarine..... B. Roberts  
 Cableway..... T. S. Miller  
 Can body machine..... W. H. Smyth  
 Can header..... C. E. Forry  
 Cans or other vessels. Ejector mechanism for oil..... R. Spence  
 Cannon pinion remover..... E. Hanson  
 Car..... S. E. Jackman  
 Car. Convertible..... H. W. Covert  
 Car couplings. Emergency yoke for..... A. P. Lavery  
 Car fender..... H. Thiele  
 Car fender and sweeper. Automatic..... C. P. Cathcart  
 Car grain door..... H. Pries et al  
 Car lever..... G. B. Sullivan  
 Car. Railway..... L. J. Harris  
 Cars to rails or tracks. Device for locking..... G. G. Newcomb  
 Cars to tracks. Device for locking ore..... G. G. Newcomb  
 Cars upon inclines. Apparatus for controlling movement of..... W. A. Snyder  
 Carbon. Producing chlorids of..... F. J. Machalske  
 Carriage top support..... F. J. Walker  
 Cash check..... L. H. Mallalieu et al  
 Cathode for electric detinning baths..... M. Laernoes et al  
 Cement receptacle mold..... J. A. Johnson et al  
 Centrifugal machine..... J. J. Berrigan  
 Centrifugal machine..... J. D. Kennon  
 Centrifugal separator..... 2 pats. H. B. Keiper  
 Chairs. Machine for making saddle seats for..... W. H. Hobby  
 Check register. Stop payment..... J. H. Rand  
 Chinney cowl..... T. B. Samuel  
 Christmas tree candle holder..... C. Schroeder  
 Churn..... J. S. Hudson  
 Churn. Rocking..... L. Van Olst  
 Clamp..... W. T. Harrison  
 Clamp..... N. K. Teilborg  
 Clasp..... F. M. Chandler  
 Clasp..... F. King  
 Clavier. Practice..... A. C. Bergman  
 Clock. Angelus..... G. W. Adams  
 Clock. Pneumatic..... E. Girod  
 Clock. Self-winding electric..... H. Rempe  
 Clock winding mechanism. Automatic..... W. M. Fulton  
 Cock. Cylinder..... J. M. Galey  
 Cocoa substitutes. Manufacturing..... J. Meul  
 Coiler head..... C. L. Hildreth  
 Coin controlled device..... W. H. Walter  
 Collar. Metallic horse..... D. F. O'Loughlin  
 Combining machine stop motion..... O. L. Owen  
 Concrete block mold..... F. A. Sicklesteel et al  
 Concrete tank framing. Metallic..... J. W. Seaver et al  
 Condenser. Steam..... R. H. Hornbrook  
 Condiment holder. Pulverizing..... C. B. Overbaugh  
 Cooker. Steam..... A. M. Amos  
 Cooking utensil..... S. Szentjanossy  
 Cop tube..... E. H. Thorne  
 Corn husker and shredder..... W. Gutenkunst  
 Corn huskers and shredders. Knife cylinder for..... E. Wisner  
 Corrugator..... T. F. Rowland  
 Crank pin setting gage..... W. A. Nunnally  
 Crate. Fruit or vegetable..... C. E. & J. O. Mansfield  
 Cream separator..... J. A. Rector  
 Creamer. Centrifugal..... H. B. Keiper  
 Crushing rolls..... C. W. McArthur et al  
 Cultivator..... J. M. Rettig  
 Cultivator attachment..... R. O. Faubion et al  
 Currycomb attachment..... W. Lewis  
 Curtain fixture..... W. Wishart  
 Cushion..... H. E. Keeler  
 Cushion..... J. H. Donaldson  
 Cuspidor..... S. S. Williamson  
 Damper. Automatic stove..... T. B. Denton  
 Dehorning implement..... W. Forker  
 Dental mixing mortar..... C. P. Schultz  
 Despatch systems. Receiving apparatus for tubular..... G. G. Powell  
 Detinned scraps. Apparatus for transferring..... M. Laernoes et al  
 Detonator. Repeating..... J. C. Caloun et al  
 Diffusion battery..... E. G. Wickersham  
 Direction in marching or traveling. Instrument for ascertaining..... J. von Bezdard  
 Disk cutters. Means for adjustably spacing..... H. Y. Armstrong  
 Display apparatus. Curtain..... M. J. Bebb et al  
 Display stand..... G. D. Bailey  
 Distilling apparatus. Wood..... C. M. Palmer  
 Dough mixer..... C. G. Garrigus et al  
 Dress form..... C. A. Ufford  
 Dress shield holder..... T. Davis  
 Drier..... K. F. Snow  
 Driving mechanism. Variable speed and reversing motion..... F. Charron et al  
 Dust collector..... L. C. Meyerott  
 Dye. Reddish brown azo..... E. Munch  
 Eaves trough..... J. B. Ralston  
 Electric brake..... F. C. Newell  
 Electric circuit closer..... C. Hubert  
 Electric heater..... W. S. Hadaway, Jr  
 Electric machine. Dynamo..... H. M. Acly  
 Electric motor..... H. Lindenberger  
 Electric motor..... A. K. Braun  
 Electric motor and generator..... A. L. Bolen et al  
 Electric safety signal. Automatic..... W. W. Keener  
 Electric stop mechanism..... S. G. Colt  
 Electrolytic apparatus..... L. P. Burrows  
 Electroplating small metallic articles. Apparatus for..... J. F. Shelton  
 Electrotyper's connecting hook..... J. W. Cornelius et al  
 Elevator door operating mechanism..... F. A. Winslow

Elevator hatch covers. Automatic device for operating..... S. E. Austin  
 Elevator safety device..... W. G. Miller  
 Embroidery silk. Reinforcing tag for holding..... F. H. Weaver  
 Engine cooling device. Explosive..... R. J. Voss  
 Engine indicator..... O. Tuch  
 Engine reversing gear mechanism..... J. P. Moskop  
 Engine sparking igniter. Gas..... B. L. Toquet  
 Engine tender coaling device..... F. J. McCalmont  
 Engine vaporizer. Explosive..... C. F. Pearson  
 Engine wheel or disk. Steam..... J. Stumpf  
 Engines. Detachable fuel box for traction..... H. C. Clay  
 Evaporator. Solar..... J. B. Blanchard  
 Expansion bolt..... C. Dorn  
 Extension bit..... C. F. Seblom  
 Extension table..... G. E. Russell  
 Eyeglasses..... H. E. Bouschur  
 Fare register..... O. N. Moore  
 Feed and safety apparatus for steam boilers. Automatic water..... O. J. & D. Coughlin  
 Feed water heater..... C. F. Ruby  
 Feed water heater..... E. T. Moore  
 Feeder. Boiler..... A. L. Clark  
 Feeding trough for stock..... C. K. Shellhamer  
 Felt. Making mineral wool..... C. C. Hall  
 Fencing purposes. Wire stretcher for..... F. Stordeur  
 Fibrous or filamentary material..... C. N. Holmes  
 Filter..... F. Bommarias  
 Filter..... S. P. Haller  
 Filtering apparatus..... J. P. Keare  
 Filtering medium and making same..... E. M. Knight  
 Fire escape..... M. Ekman  
 Fire escape..... J. B. Howe et al  
 Fire escape..... A. W. Riches  
 Fire escape..... W. Benney  
 Fire escape..... M. C. Young  
 Fire extinguisher. Automatic..... I. Kitsee  
 Fire resisting material. Manufacture of flexible..... R. J. Friswell  
 Fireproof floors. Adjustable joist for supporting..... T. O'Brien  
 Fireproofing wood..... A. M. Pierce  
 Fireman's helmet..... C. Eagle et al  
 Fishing net..... T. C. & T. C. Lindsey, Jr  
 Flax balls and preserving the seeds. Machine for breaking..... J. T. Smith  
 Flax or hemp straw. Apparatus for spreading and thinning..... J. T. Smith  
 Flour packer..... C. W. Geiger  
 Fly wheel..... J. F. Radebaugh  
 Fob bar..... E. A. Bennett  
 Folding box..... J. H. Garman  
 Folding table..... W. J. Noble  
 Food compound..... F. M. Libby  
 Foot attachment..... J. Wright  
 Forging machine..... J. R. Blakeslee  
 Formaldehyde generator..... R. W. Johnson  
 Fruit into boxes. Device for pressing..... W. C. Anderson et al  
 Fuel. Composition..... F. C. Rockwell  
 Fumes formed in volatilization processes. Apparatus for condensing..... R. McKnight  
 Furnace..... T. Murphy  
 Furnace door..... J. Horvath  
 Furnaces. Gas seal for metallurgical..... S. Stewart et al  
 Furniture polish..... W. H. Paxton  
 Furrow opener. Double disk..... H. C. Ham  
 Fuse..... W. J. Lloyd  
 Fuse block..... J. Sachs  
 Fuse. Combination..... O. Hartmann  
 Fuse or cut out. Electric..... L. W. Downes  
 Fuse or cut out. Electric safety..... L. W. Downes  
 Fuse. Safety..... 4 pats. J. Sachs  
 Galvanic battery..... C. B. Schoenmehl  
 Game apparatus..... J. E. Clark  
 Game apparatus..... J. Chaboty  
 Game. Electric field..... G. Majno  
 Garment..... E. W. Merrill  
 Garment fastener..... J. E. Pratt  
 Garment fastener..... J. H. Simpson  
 Garment hanger..... C. F. Hurst  
 Garment hanger..... F. W. Leimberger  
 Garment hook forming machine..... A. C. Campbell  
 Garment retainer. Adjustable..... E. L. Merrill  
 Garment supporter..... J. L. Moore  
 Gas burner and pilot light. Manually controlled..... A. W. Webb  
 Gas burner self igniter..... F. C. N. Parizot  
 Gas generator. Acetylene..... H. & S. H. Hawkins  
 Gas generator. Acetylene..... C. M. Stroud  
 Gas generator. Acetylene..... R. H. Welles  
 Gas generator. Acetylene..... C. W. Beck  
 Gas generator. Acetylene..... 2 pats. J. Summerfield  
 Gas lights from a distance. Apparatus for lighting or extinguishing..... E. A. P. Thiem  
 Gas pipes. Automatic cut off for..... R. F. Kenehan  
 Gases. Apparatus for disposing of foul..... E. R. Edson  
 Gate..... E. Stickler  
 Gate..... R. A. Bruce  
 Gear. Chain driving..... E. F. Morse  
 Gear for motors. Speed..... A. B. Holson  
 Gear wheel. Split..... J. Carlson  
 Gearing. Change speed..... D. P. Mooers  
 Glass beveling apparatus..... C. L. Goehring et al  
 Glass beveling machine..... 2 pats. C. L. Goehring et al  
 Glass. Clamp for holding plate..... M. E. Hunter  
 Glass. Etching..... B. Z. Meth  
 Glass grinding machine..... 5 pats. C. L. Goehring et al  
 Glass. Manufacture of sheet..... W. Pilkington  
 Glass press..... E. Rogers et al  
 Glass rinsing device..... F. G. Kammerer  
 Glazed structure..... W. V. Hickerson  
 Glutinous substances from seaweed. Extracting..... A. Kretting  
 Gold and other metals from ores. Apparatus for extracting..... E. L. Vander Naillen  
 Golf ball..... W. M. Short  
 Governor..... 2 pats. F. M. Rites  
 Grading and ditching machine..... T. J. Gray  
 Grain binder cord holder..... E. A. Johnston  
 Grain drill..... G. P. Oates et al  
 Grain drill..... 2 pats. D. B. Saltsman  
 Grain drill discharge tube..... W. Fetzner  
 Grain drill disk furrow opener..... D. B. Saltsman  
 Grain drill distributor..... G. P. Oates  
 Grain drill fertilizer attachment..... H. C. Ham  
 Grate..... W. Wewers

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

Foreign patents may also be obtained in certain other countries.

**FREE!**

Send us 2 cents to pay for postage and we will mail you a valuable copyrighted book, "How to obtain Patent, Caveat, Trade-Mark and Copyright Protection, with Decisions in Leading Patent Cases" entirely free of charge. Address:

INVENTIVE AGE PUBLISHING COMPANY,  
 (Dept. P.) WASHINGTON, D. C.

The Manhattan  
 Typewriter,  
 Guaranteed to be of the  
 Highest Grade.

NOT IN THE TRUST.

PRICE \$50.

JOHN C. PARKER,

619 Seventh St. N.W., Washington, D. C.

## Drawings for Inventors.

If you want copies of the drawings of your patent, we can procure them at these prices:

12 copies, each sheet full size (8x13)	\$ 2.50
25 " " " " " "	3.50
50 " " " " " "	4.50
100 " " " " " "	7.00
500 " " " " " "	13.00
1000 " " " " " "	17.00

12 copies, each sheet reduced 1/2 (8 1/2 x 5 1/2)	\$1.25
25 " " " " " "	2.00
50 " " " " " "	3.00
100 " " " " " "	4.00
500 " " " " " "	7.50
1000 " " " " " "	9.00

These copies will be made by the photo-lithographic process, by the same firm which photo-lithographs the Patent Office work, and will be equally as good as the drawings accompanying your letters patent. Five hundred copies of your patent would cost you at least \$25. We can furnish 500 copies of the drawings, if contained on one sheet, for \$13 full size, or \$7.50, if reduced one-third, the same reduction as your letters patent drawings. Your valued orders solicited.

The Inventive Age Publishing Company,  
 WASHINGTON, D. C.

## Attention Inventors!

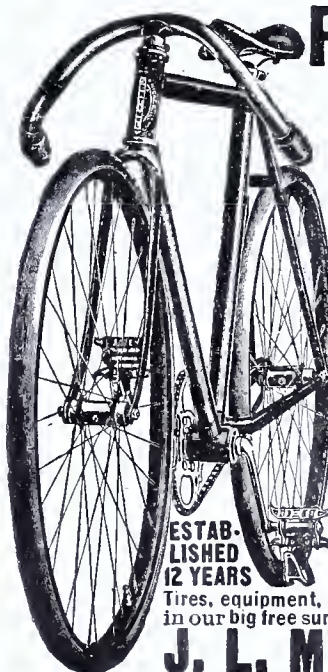
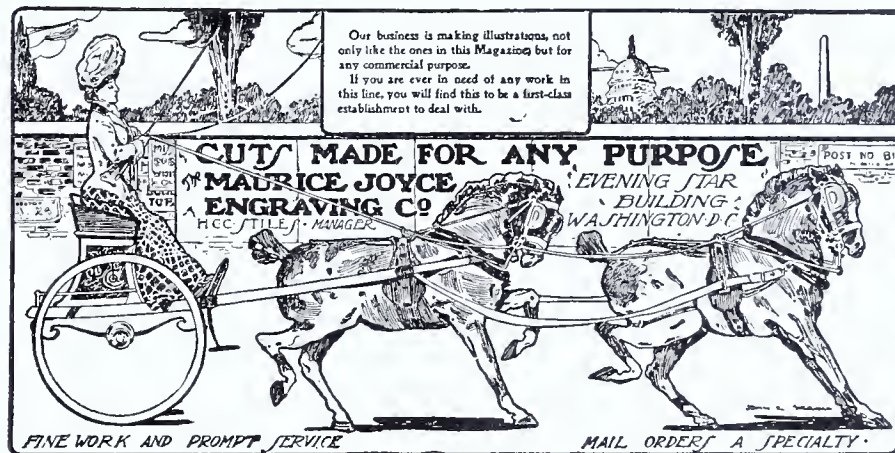
LISTS OF MANUFACTURERS FURNISHED.

We are prepared to furnish lists of manufacturers in any line of industry.

Charge one dollar.

In ordering, please state specifically the class of manufacturers desired.

Address: INVENTIVE AGE Pub. Co., Dept. M. 918 F. St., Washington, D. C.



## RIDER AGENTS WANTED

in each town to take orders for our new High Grade Guaranteed Bicycles.

## New 1903 Models

"Bellise,"	Complete	\$8.75
"Cossack,"	Guaranteed High Grade	\$10.75
"Siberian,"	A Beauty	\$12.75
"Neudorf,"	Road Racer	\$14.75

no better bicycle at any price.

Any other make or model you want at one-third usual price. Choice of any standard tires and best equipment on all our bicycles. Strongest guarantee.

We SHIP ON APPROVAL C. O. D. to any one without a cent deposit and allow 10 DAYS FREE TRIAL before purchase is binding.

500 Second Hand Wheels \$3 to \$8

taken in trade by our Chicago retail stores, all makes and models, good as new. DO NOT BUY a bicycle until you have written for our FACTORY PRICES AND FREE TRIAL OFFER. Tires, equipment, sundries and sporting goods of all kinds, at half regular price, in our big free sundry catalog. Contains a world of useful information. Write for it.

J. L. MEAD CYCLE CO., Chicago, Ill.

Continued in October Number.



AN ELEGANT REPRODUCTION OF A CHARMING

# \$75,000.00 Painting

Given Away



REDUCED ILLUSTRATION

"THE VILLAGE WEDDING"

FULL SIZE 25 BY 38 INCHES

FOR several years the publishers of the WOMAN'S HOME COMPANION have been searching for something, to give to their subscribers, that would ECLIPSE ANYTHING EVER OFFERED BY ANY PUBLISHING-HOUSE IN THE WORLD.

At last, at great expense, they are able to make it possible for every home in America to possess a magnificent and faithful reproduction of one of the most remarkable paintings ever produced by mortal man in this or any other age. It secured for the artist the honor of immediate admission to the ranks of the Royal Academy. The original painting was shown all over Europe, and thousands upon thousands of people gazed upon it with rapture. It was quickly bought up for \$75,000.00, and placed in the position of honor in one of the most celebrated galleries in Europe, and no American money yet offered has been able to secure it for this country. The whole picture fascinates one with its absolute accuracy to life. Every figure in itself alone is a study that would make a wonderful picture. Every face is alive with the spirit of action. It is a picture of mirth and merriment; a picture to bring sunshine into every home and the heart of every one who gazes upon it. You cannot tell our engraving from the only other authorized reproduction, which sells in Europe for \$18.00 (eighteen-dollars). Our exquisite reproduction is 25 by 38 inches, including margin, the exact size of the costly European engraving, and will be a splendid addition to the art collection of any home, whether framed or hung without framing, a fashion now so much in vogue.

**WOMAN'S HOME COMPANION** This magazine is edited and made up in the city of New York, the leading literary and art center of America. It contains the most timely illustrated articles, the most beautiful illustrations, the best short stories, the most popular serial stories, the most practical household departments, the best of everything desirable for a home magazine. It is printed on the finest paper, has 44 to 60 large pages, 11 by 16 inches. The twelve numbers will contain more than one thousand beautiful illustrations. Each month it carries a message of help, profit, pleasure, education, culture and refinement to over two million readers. Its editors and contributors are the most popular American writers. It is altogether the cleanest, brightest, handsomest, choicest and best of American home magazines.

**\$7.00 for \$1.85**

"THE VILLAGE WEDDING," very, very cheap at \$5.00  
 WOMAN'S HOME COMPANION one year, price 1.00  
 INVENTIVE AGE & PATENT one year, price 1.00  
 = = INDEX = =

A total  
 value of  
**\$7.00**

**BOTH PAPERS ONE YEAR AND THIS PICTURE SENT  
 TO ANY ADDRESS**

For  
 Only **\$1.85**

In this offer, although paying less than the ordinary and regular price of the papers for a year, you get in addition the above-described charming picture **ENTIRELY FREE.**

The papers and picture in the above offer can go to different addresses.

**THE ABOVE OFFER APPLIES TO OLD OR NEW SUBSCRIPTIONS.**

**SEND ALL ORDERS TO**

**INVENTIVE AGE PUBLISHING COMPANY.**  
 WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

# THE Inventive Edge

AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 10.

WASHINGTON, D. C.—OCTOBER, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

## Beer Making in Germany.

THE accompanying photograph illustrates the interior of one of the huge beer establishments in Germany, showing the apparatus employed in the manufacture of the product. The making of beer forms one of the largest and most remunerative industries of the German Empire. Beer is the national drink, and it is exported to every country in the world. It is estimated that the annual production in Germany amounts to no less than two billion gallons, and the consumption in that country is about 300 gallons per capita.

Beer can be made not only from barley, maize, wheat and other grains, but from beet roots, potatoes, turnips, beans, cane syrup and molasses. It is common in Germany to use potatoes and beet roots in its manufacture, but the beer that bears the best reputation and is the most widely exported—that from Bavaria—is prepared from barley malt. There are many varieties of beer on the market: ranging from a liquid almost as colorless as water, which sells at the low rate of about three cents a pint and is especially favored by the soldiers and working classes, to a dark, thick and heavy product. The Bavarian beer possesses the unusual advantage of not turning sour on exposure to the air, so that it can be preserved in half full casks equally well as in full ones. This quality it owes to the way in which it is fermented, the process employed being that of fermentation from below. The malt-wort is set to fer-

ment in open backs with an extensive surface, and placed in cold cellars with a temperature not higher than 50 degrees. The operation lasts from three to four weeks, and the wort, instead of showing a large head of froth, is hardly covered with any, the yeast sinking to the bottom in the form of a viscid sediment. This bottom-yeast

those when the seed is planted in the soil. The malt house consists of several floors, and the grain is kept in water in tanks on the top floor for about two days. It is then dropped to the floor below and spread out in layers about a foot high. Here it begins to sprout, and when germination has proceeded far enough, the product is dried in kilns on the lower floors, and cleaned. A recent invention provides for the use of drums in the malt-ing process, which consist of concentric cylinders between which the grain is placed. By means of turning the

allowed to ferment. After a certain time, the liquid becomes clear, and it is then stored or sent to market.

The discovery of Pasteur, some 25 years ago, that the disease of beer, causing it to spoil, was due to bacteria, led to many improvements in manufacture. Filtered air, rendered germ free, and sterilized water are now employed in the best establishments. The application of artificial refrigeration on a large scale was another important step in the industry. An innovation that has attracted attention of late is the collection and utilization of the carbonic-acid gas formed during the process of fermentation. This is an American discovery and it has made it possible to abandon the old fashioned method of carbonating. The finished product may now be charged with the best carbonic acid gas. This collection of the by-product of fermentation produces such a superabundance of carbonic-acid gas that it may readily be liquified, and promises to crowd out of the market all other products of its kind.

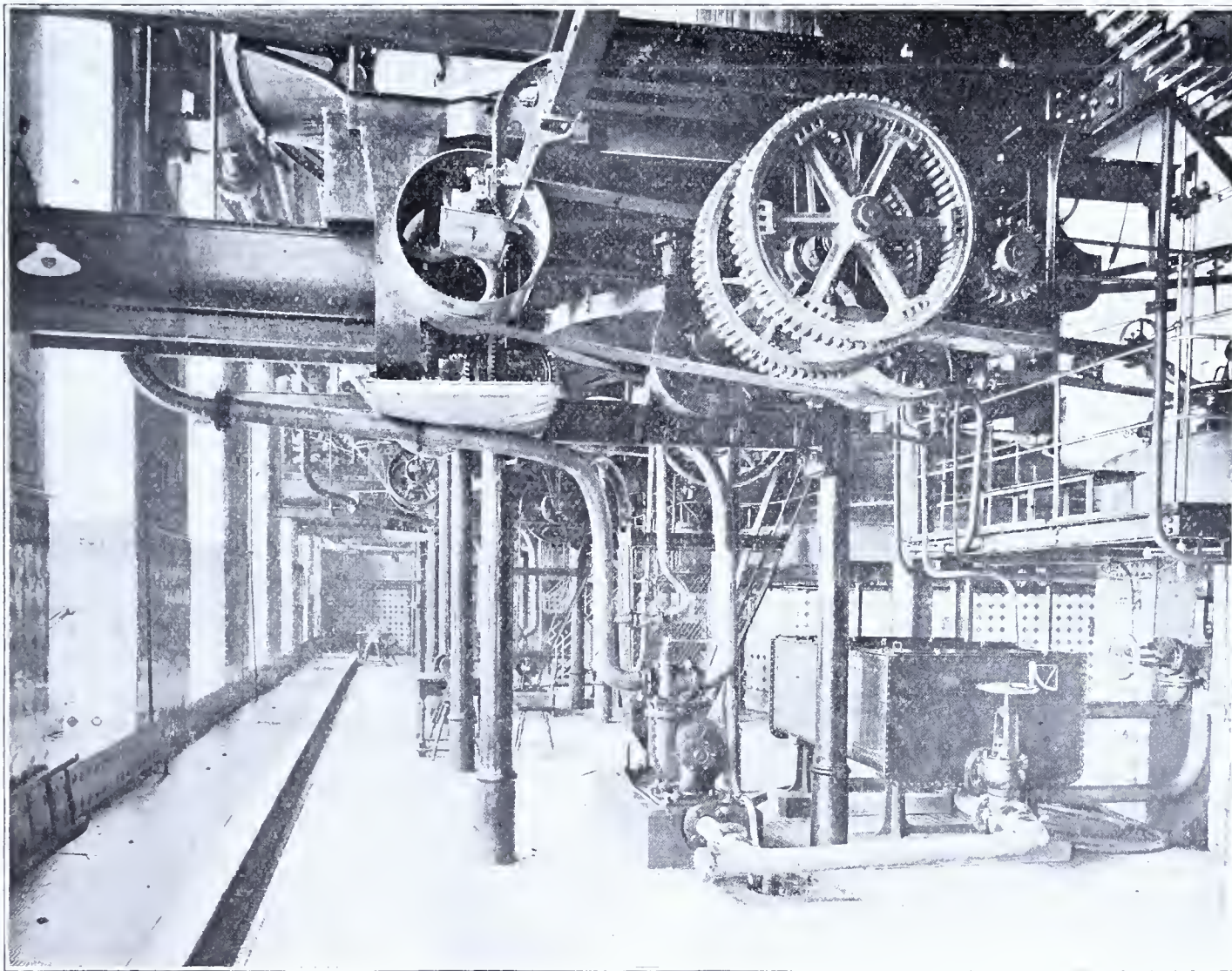
The residue left after the wort is produced is called in Germany "beer grains." These constitute a fodder rich in protein and fat, and have proved to be most useful for fattening stock, as well as for the dairy. Dried grains are said to be superior to the wet ones as the latter are apt to spoil. An elaborate system of drying the grains is in use in

Germany, by means of which they are so concentrated that they can be transported for long distances.

In the establishment illustrated, 1,000 skilled men are employed. The following statistics give an idea of the internal arrangements: It contains one seasoning tank of 6,340 gal-

is a different substance from the precipitate which falls to the bottom of the backs in the ordinary fermentation of beer. In the method commonly employed to make beer, the barley is first malted, which is in reality an artificial or forced growth of a seed, the changes taking place being similar to

drums, the grain is kept in motion, and is constantly aerated. The malt, after being cleaned, is crushed and mashed under high temperatures: the infusion, or wort, is boiled, hops or some other vegetable product of an agreeable bitterness is added, the whole is boiled again, and the wort is





lons capacity: three huge malt vats with 3,434, 5,943, and 6,868 gallons capacity, respectively; two cooling reservoirs which will hold 4,642 and 5,679 gallons of beer, respectively, together with malt elevators, ice-making machines, fermentation tanks, and revolving cranes. The steam necessary to drive the machinery is generated in two large boilers, each having an extraordinary capacity for creating heat. In connection with these boilers there are four subterranean pits, each capable of holding 27,557 pounds of coal.

#### New Dental Gutta-Percha.

In order to obtain in a single preparation the combined properties of gutta-percha and cement, a German, Dr. Emil Herbst, has devised the following method: A given quantity of cement powder is mixed thoroughly with an equal amount of base-plate gutta-percha filings, and into the resulting mixture a small amount of cement liquid is incorporated. This paste becomes thoroughly hard and can be advantageously used in setting crowns and bridges. It becomes soft and malleable when heated, and therefore a bridge set with it can be easily removed. Incidentally, he refers to another method of obtaining a gutta-percha and cement compound, which consists in mixing together equal quantities of cement paste and gutta-percha solution. This combination makes a preparation which easily adheres to the walls of the tooth and becomes slightly soft upon being heated. Dr. Herbst offers these methods as mere suggestions on the possibilities of mixing cement with gutta-percha with the object of obtaining a material possessing the advantages of both, and he says that the results obtained in the few cases in which he has tried the combination would warrant its further trial by the profession.

#### Brittle Steel Made Sound.

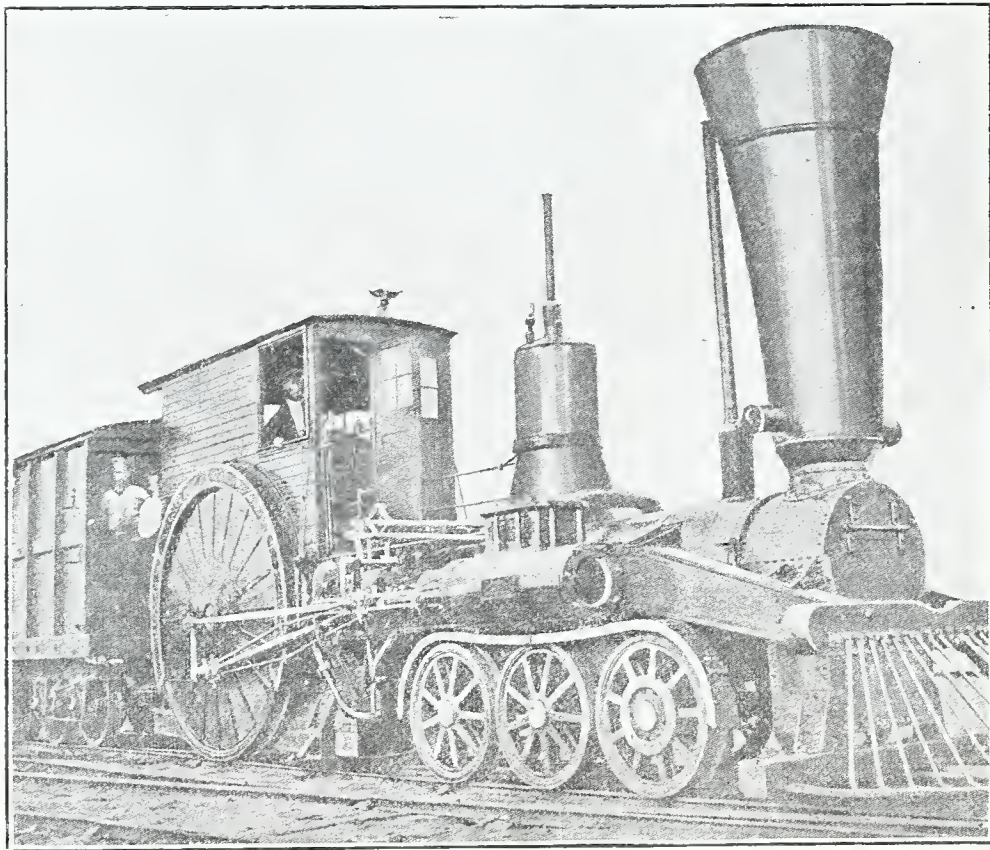
After much research and repeated experiment in the treatment of steel, a result has been attained that will, it is thought, prove of far-reaching importance. It has been demonstrated that dangerously brittle steel can be restored to a sound condition by a simple process of re-heating. That is not in the nature of a wonderful discovery: it is merely the affirmation of a fact which for some years has been suspected; but with the knowledge of the latest process, manufacturers can now make the material which they produce, at least reliable.

Many accidents on land and sea are caused by the breakdown of parts of machinery composed of what is technically known as dangerously crystalline steel. Hitherto, this hidden defect has been regarded as inevitable, but in future there will be a remedy.

This discovery will be of value, not only to the trade, but to everybody who travel in trains and steamships, or who are in any way dependent for safety upon the working of machinery. It is stated that the Board of Trade of England will require all manufacturers to adopt the process of re-heating. A recent demonstration at a meeting of civil engineers has led Mr. J. E. Stead, brother of the noted journalist, to conclude that 99 per cent of the steel which has formerly been thrown on the scrap heap, could be restored.

### AN "EIGHT-FOOTER" OF FIFTY YEARS AGO.

By the courtesy of *The Model Engineer and Electrician* we are able to publish a photograph taken as far back as 1848, of an interesting old Crampton locomotive, one of several built in America by the Norris Works, in the year 1845, for the Camden and Amboy Railroad. No. 28 had cylinders 13 ins. by 34 ins., and driving wheels 8 ft. diameter. The firebox was 6 ft. long, and the carrying wheels were 36-ins. diameter, the middle wheel having no flanges.



AN OLD CRAMPTON LOCOMOTIVE.

All the engines had separate cut-off valves operated by a hook motion. The huge chimney and covered-in cab and tender require little pointing out, but a noteworthy object will be seen at the back of the tender—viz., a hooded seat for the guard, who looked back along the train in a similar manner to those originally placed in the same position on the old Great Western Railway broad-gauge engines. Altogether, the picture is a most interesting relic of a bygone race of locomotives.

#### Gold from Placers.

Among the most recent and valuable inventions is one by Thomas A. Edison, in a line somewhat different from those which the world associates with his name. It consists of a method of winning gold from placer sands without "washing." Heretofore, sands producing gold have been cradled or swished through flumes with riffles in order to catch the gold; or they have been dredged by a machine which takes the gravel up from bottom of rivers, etc., and separates the gold in riffled flumes on the dredger. But the vast extent of gold-bearing sands in localities where water is unavailable (estimated at 100,000 acres in the United States alone) calls for some other method, and it is to meet this need that the present invention will be applied. Besides, wet-placer operations have sometimes had to be stopped, because the debris was discharged on fertile farm lands lower down the streams, causing complaint from the owners. This has happened more than once in California within the past year.

The new apparatus for dry-placer work causes a large volume of air to be blown through a horizontal pipe, against and through a transversely placed wire screen, which serves to split up the air, so to speak, and equalize the pressure, thus, avoiding

eddies and back currents. The regulated air current then meets a falling sheet of placer sand, and catching up the light particle carries them over to a set of open shutters, placed transversely to the pipe across its bottom, where it is diverted into a separate discharge hopper. Other shutters and hoppers, placed nearest the ore sand entrance, catch the heavier gold particles and carry them into the locked gold drawers, the intermediate shutters catching the gold-bearing black sands.

According to the best geologists, placer gold has been deposited from gold-bearing solutions. Something in the sand caused the gold to be precipitated there. These deposits grew with time and replenished the solutions, until sometimes the original gold attractor was completely replaced, causing the formation of flat or ovoid nuggets. Other gold particles fell off the gold collector, either by later abrasion of sand on sand or by unequal precipitation, and these flat, shimmering gold scales constitute what is known as "flour gold." Of the dry-placer machines now in use, most will save the coarse gold nuggets; some will save part or all of the black sand and gold, but so far, none has ever succeeded in saving the "flour" gold. Yet this flour gold represents at least one-third of the total gold contained in a deposit, the coarse gold ranging from 40 to 70 per cent in weight. Therefore the saving of the flour is of great importance.

#### Illuminated Shells.

A new function has been added to the shells commonly employed in warfare—visibility of flight by night. A torch is attached to the base of the shell, and by means of this, its progress can be observed throughout its entire course, and the precise point where it strikes can be located. With the automatic guns that are coming into general use, and with the one-pound shells that are fired at the rate of about four shots a second, a practically continuous stream of fire will be thrown, which can be directed like water from a hose, without taking the trouble to use the sights of the gun or find the range.

The illuminated shell was invented by a Pittsburg man, who has had it patented not only in the United States but in European countries as well; and it is said that this new invention for warfare is now being tested by the Army and Navy in our own country, and in England, Germany and France. Speaking on the subject, an authority in military matters says:

"Although much of practical value was learned from the naval battles of the Spanish war, there was no opportunity to prove the effectiveness of the modern torpedo boat in the hands of daring and competent men. In repelling the attacks of these fleet little vessels, it is easy to imagine how difficult is the work of the gunner, when suddenly the light of the battleship 'picks up' an incoming torpedo boat, where but a moment before the sea was blank. There is no time to find the range or elevate the sights. The swiftly moving destroyer must be hit, and hit hard, before it reaches the 800 yard mark, where it will discharge its first 18-inch Whitehead.

"The time allowed the gunner in which to strike some vital part is a little over one minute. Behind him are the lives of 600 men, his own life, a four-million dollar battle-ship and the cause for which he is fighting. In front is the desperate destroyer, certain of accomplishing its end unless stopped before it gets too close.

"The knowledge of the result if he fails, the short time, the suddenness with which he is called into action, all tend to make his work extremely difficult. The combined attack of several destroyers at once would, under present conditions, prove almost impossible to resist. It is for these emergencies, when accuracy and extreme rapidity of fire are demanded, that the illuminated shell is expected to be most effective."

Exhaustive tests by the army have shown that by its aid field batteries can go into action at night without any previous knowledge of the range, and that it promotes the effectiveness of fire from coast artillery by showing the exact trajectory of the shell, the drift by the wind, and the amount of "lead" necessary to strike a swiftly moving vessel at long range. Without the data gained by watching the flight of the first shell, the correction for wind and speed of a moving target would be largely a matter of guess, and while the range can be correctly given, and the sights accurately set, it still requires uniform velocity of the shell for accurate work.



## - - - Electric Lights on Railway Trains. - - -

THE various attempts during the past few years to introduce electricity as a means of light on railway trains, and the many experiments connected therewith, have proved that only a very limited number of the different systems now in use may be termed a technical and economic success. A railway train running at a high rate of speed presents many difficulties which are not easily overcome in the application of electricity from stationary plants. These obstacles accumulate when we take into consideration that an even volume of light must be provided for the same train, not only when it is in motion, but when it is stopping at stations as well.

To the casual observer it would seem that any arrangement which will admit of all the lamps of a whole train being lighted up from some one central dynamo must, in the nature of things, be the most practical method which might well be adopted. Theoretically, this could only be possible when based upon the assumption that a railway train would always be made up with the same number of cars, and that the central accumulators had been tested and finely gauged to a train the length of which is invariably the same. The best solution of the problem has been found in the method which enables each

while the train is in motion. Simultaneously, a small battery is charged with electricity from the same dynamo. The battery then serves the purpose of keeping up the current while the train is stopping at stations. Generally speaking, however, the lamps should be fed as long as possible directly from

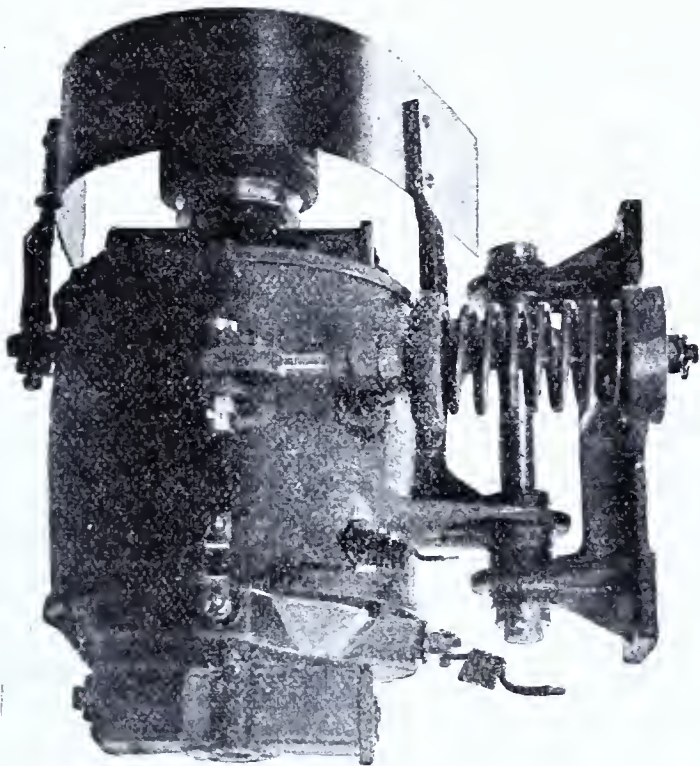


FIG. 1.

carriage of a railway train to be lighted separately and independently of the others. For example, in the Dick system, as explained, each car is supplied with a small dynamo which is attached to the axle of the car wheels. This dynamo drives the necessary current for creating light into the lamps,

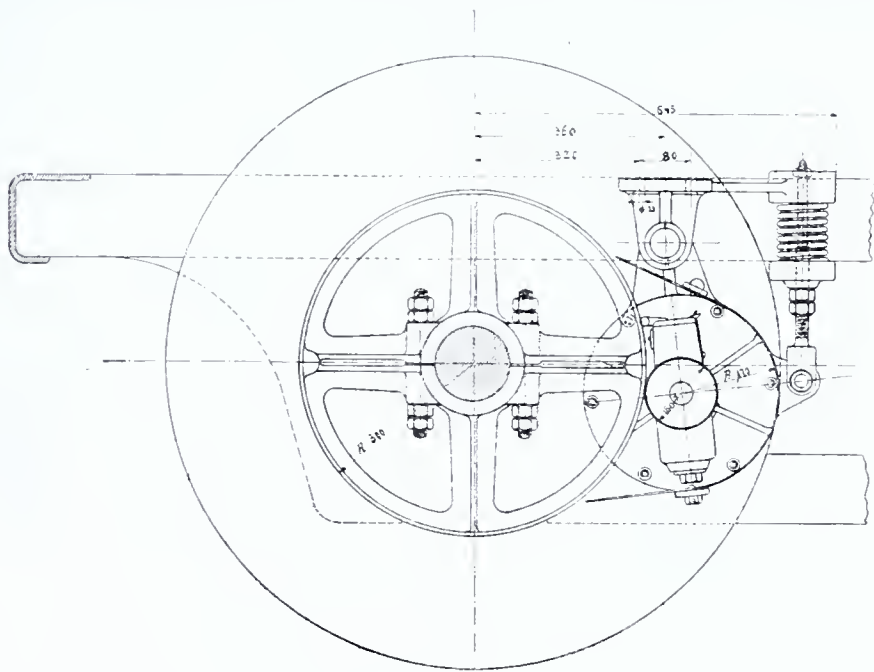


FIG. 2.

mo must, in the nature of things, be the most practical method which might well be adopted. Theoretically, this could only be possible when based upon the assumption that a railway train would always be made up with the same number of cars, and that the central accumulators had been tested and finely gauged to a train the length of which is invariably the same. The best solution of the problem has been found in the method which enables each

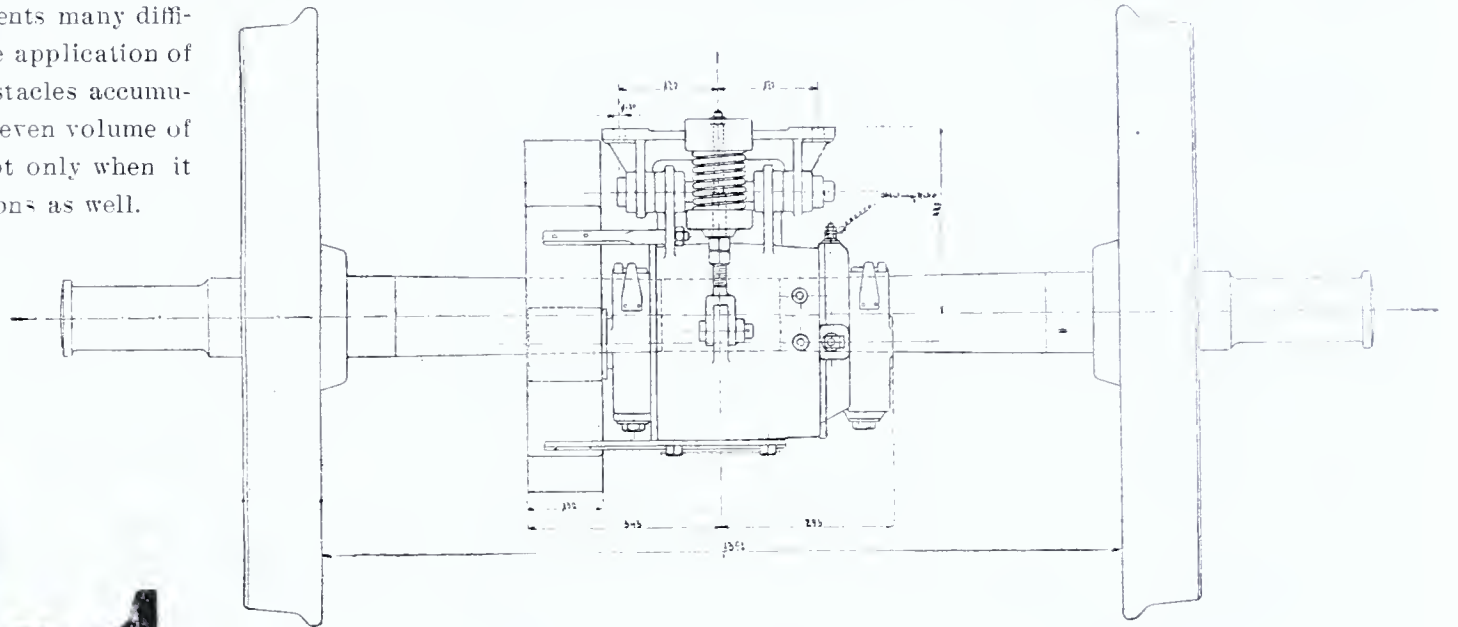


FIG. 3.

the dynamo in order that the battery may be spared. During stops, and when the train is going at a slow rate of speed up steep grades, the lamps are always fed from the battery. The accumulators are charged while the train is in motion, and this is the case by day as well as by night.

The Dick system has been adopted by the Oesterreiche Schuckert-Werke in Vienna, Austria, and this company has fitted up a large number of railway carriages with this apparatus.

The machinery and apparatus of the Dick system are divided into four parts, namely, dynamo, storage battery, apparatus safe and circuit wires, installations, etc.

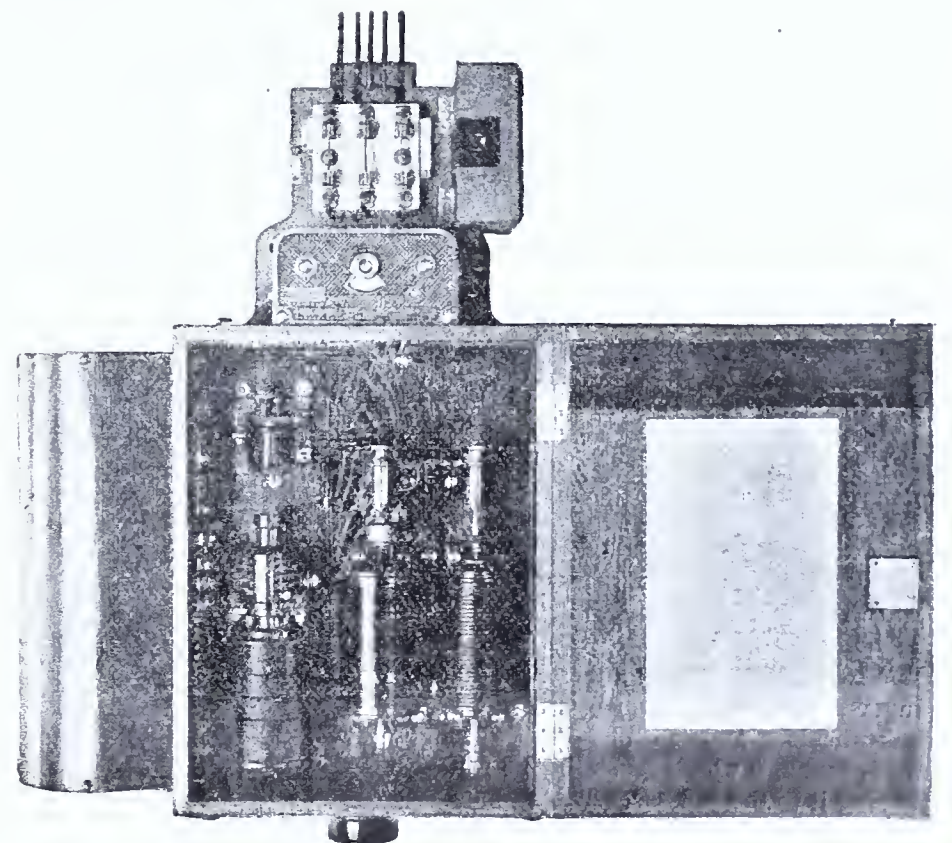


FIG. 4.

*Dynamo.*—Fig. 1 shows the dynamo; while Figs. 2 and 3 show how it is attached to the axles of the car wheels, whereby the current is generated by means of friction. The average number of volts produced by the velocity of from 700 to 2,400 revolutions is 45 amperes. The weight of the dynamo is 440 pounds.

*Battery.*—Two batteries (fig. 4) of medium size will supply 22 lamps, each having a lighting capacity of 8 candles, during a period of five hours without being recharged from the dynamo. The batteries are protected by safes which may be placed in any convenient part of a railway carriage. Exact instructions are posted on the door of each safe for the benefit of the porter or others whose duty it is to look after the apparatus.

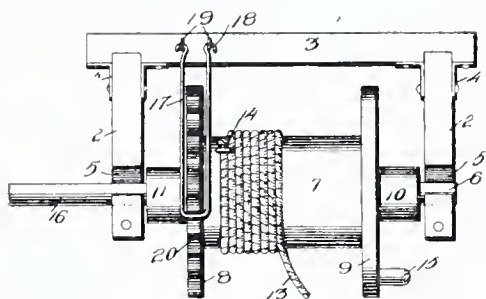


## CLEVER NEW PATENTS.

Clothes Line Reel.—Track-Brake.—Metallic Post.—Swing Attachment.—Truck for Handling Cheese.

### Clothes Line Reel.

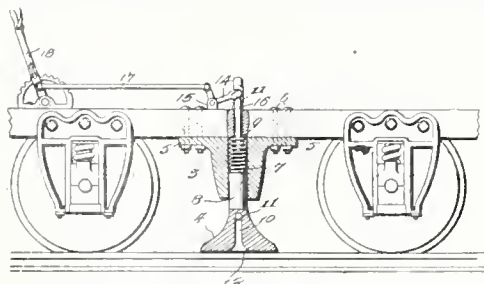
An ingenious clothes line reel has been devised by John McKee, of Warren, Ohio. The device, which is exceedingly simple and inexpensive in construction, is adapted to permit a clothes line to be quickly put up and taken down, and it enables the clothes line to be readily unreel from it or, reeled on it, as the operator walks from one point to another. After the clothes line has been arranged for use, it will enable the same to be tightened to the desired tension, and will effectually prevent a line from slipping. It permits a clothes line to be stored away when not in use to prevent it from being soiled or injured by the weather.



In the accompanying illustration, 1 designates a bracket designed to be secured to any suitable support and composed of sides 2 and a connecting cross bar 3. The sides of the bracket are provided with open bearings 5 to receive a shaft or spindle 6, and mounted upon the latter is a drum 7 which is adapted to receive a clothes line. The shaft or spindle is extended at one end to form a handle, by which the drum is carried in putting up and taking down the clothes line. The drum has an eccentrically-arranged handle 15, and it is provided at the opposite side with ratchet teeth 20, adapted to be engaged by a pawl or dog 17, whereby the drum is held after the clothes line has been stretched to the desired tension.

### Track-Brake.

A combined track-brake and sanding device for electric cars is the subject matter of a patent recently granted to Orlando Keen, of Allentown, Pa. Secured to the wheel-piece of an ordinary truck is a hanger 3, with which is associated the brake-shoe 4. The hanger is disposed intermediate of the truck-wheels, and is provided with ears 5, through which pass bolt 6 for securing it to the bolster. The hanger



is provided with a bore 7, in which is housed the shank 8 of the shoe, and arranged in the chamber above the shank is a spring 9, one end of which bears against the bolster and the other end against the shank. The shoe is

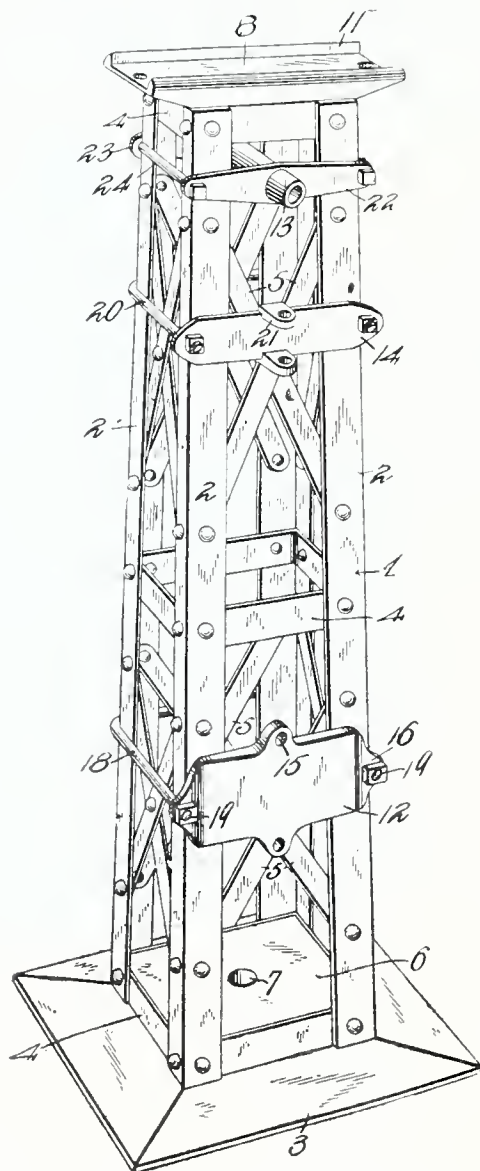
provided with a channel, 10, arranged intermediate of its ends and opening laterally near the lower end of the hanger, and with this latter terminal of the channel connects a pipe 11, communicating with the sandbox (not shown), the valve of which is to be under control of the motorman. The lower terminal of the channel is flared or enlarged at 12 in order that the sand may be spread practically across the entire width of the rail, and the contact face of the shoe is concave or shaped to fit the rail.

The normal tendency of the spring 9 is to force the shoe against the rail, the spring to be of such strength that when it is released from retention by mechanism it will force the shoe against the track and hold it there with sufficient power to set up such frictional resistance between the shoe and the sanded rail as positively to stop the car on any grade however steep.

The mechanism for holding the shoe out of engagement with a rail comprises in this instance a bell-crank lever 14, pivoted at its bend between ears 15, carried by the bolster. One member of the bell-crank lever is pivotally connected with a stem 16, rigid with the shank of the shoe and projecting upward beyond the wheel-piece, and its other member is connected with one end of a draw-rod 17, the other end of which is connected with a locking-lever 18, disposed at any preferred point on the truck or on the front platform of the car, to be in reach of the motorman.

### Metallic Post.

Mr. Gottlieb Schneider, of Bluffton, Indiana, has recently patented a metallic post, and has assigned the patent to the R. G. Marcy Manufacturing Company, of the same place. The



metallic post, which possesses great strength and durability, is at the same time simple and comparatively inexpensive; and while it may be advantageously employed in various structures, it is particularly adapted for supporting electric lights.

In the accompanying illustration, 1 designates a post, constructed of

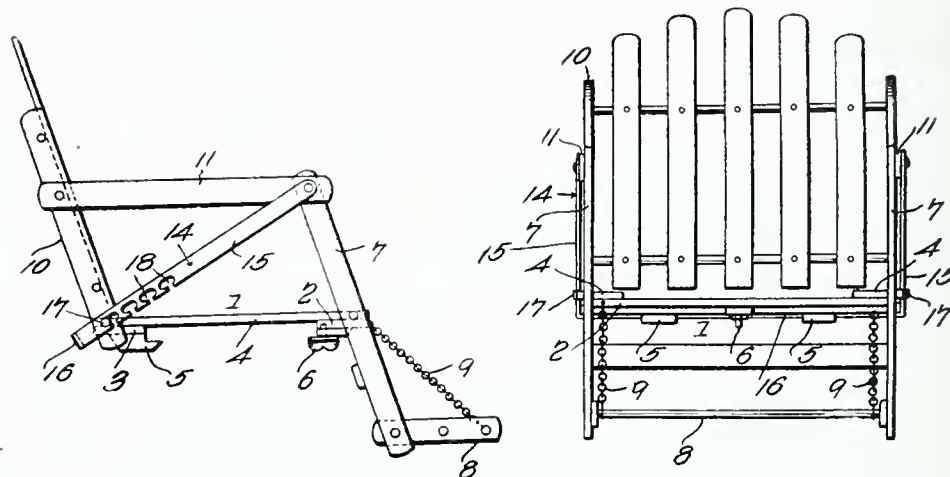
steel or other suitable metal and composed of angle bars 2 arranged at the corners of the post and connected by horizontal frames 4, and inclined braces 5. The base 3, is provided with a central enlargement 6, which extends upward into the lower rectangular frame 4.

In order to adapt the post for supporting an electric light, it is pro-

vided with a lower plate 12 for the attachment of a windlass, and it has a top sleeve 13 for the reception of a bar from which an electric light may be suspended. A horizontal supporting bar 14 is arranged a short distance below the sleeve 13 for supporting a swiveled pulley or wheel, which is designed to be connected with the windlass and the lamp.

### Swing Attachment.

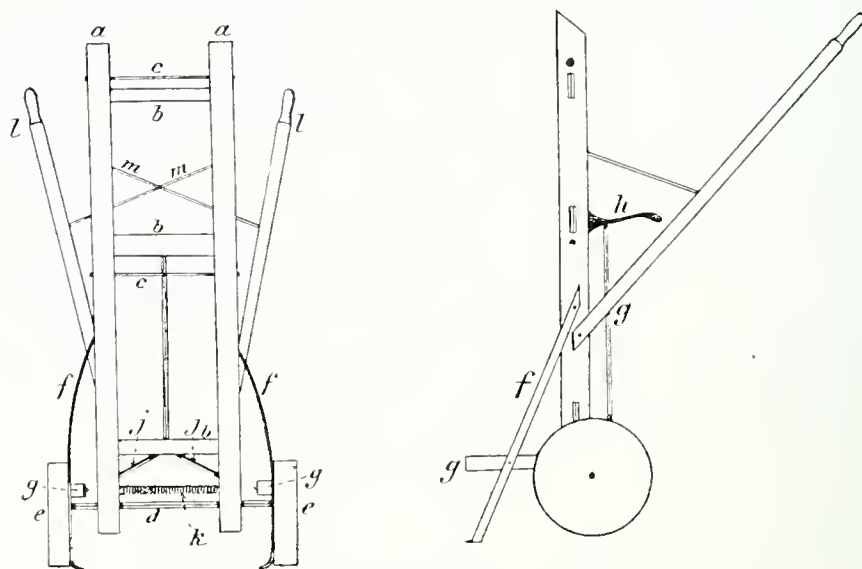
Mr. George S. Kerr, of Boothwyn, Pennsylvania, has invented a chair attachment, which is adapted to be applied to rope swings having wooden seats. The device is detachably secured to the seat of a swing, and can be readily applied to and removed therefrom. The occupant is permitted to sit directly upon the seat of the swing, while the attachment furnishes a support for the back, and a rest for the feet.



In the accompanying illustration, 1 designates a horizontal seat-receiving frame composed of front and rear cross bars 2 and 3 and side bars 4, which are secured to the upper faces of the cross bars 2 and 3. The front and rear cross bars 2 and 3 are arranged at the front and rear edges of the seat of the swing, and they are secured to the same by means of rear clamps and a front pivoted button 6. Pivoted to the side bars are upright bars 7, extending above and below the seat frame and supporting a pivoted foot rest 8, which is connected with the front of the frame 1 by short chains 9. A back 10 is pivoted to the side bars 4, and is connected with the upper ends of the bars 7 by arm bars 11. The back is adapted to swing backward and forward, and it carries with it the bars 7 and the foot rest. It is secured at the desired adjustment by means of a metal yoke 14, provided at opposite sides with notches 18 adapted to engage the pivots 17 of the back. By disengaging the yoke from the pivots, the back and the bars 7, which carry the foot rest, may be readily arranged at any desired adjustment.

### Truck for Handling Cheese.

The following illustration and description of a Canadian invention for handling cheese, is believed to be of interest and value to the merchants and manufacturers engaged in the dairy trade. It consists of two wooden standards, *a, a*, 2 by 3 inches by 5 feet high, securely fastened together by cross pieces and rods, *b b b* and *c c*. To these standards is fastened an iron axle *d*, with wheels, *e e*, about 8 inches in diameter with 2-inch face fastened to either end. Strips, *f f* and *g g*, of band iron are used as clamps to catch the sides of the boxes of cheese, rendering it easy to pick up a pile of cheese as high as, or higher than, the truck. These clamps are operated by means of



lever *h*, rod *i*, and braces *j j*, which, being pressed down, hold the clamps together on the boxes. These are held in place by a "dog" on the back of truck, which is not shown in the drawing; which, being released, allows spring *k*, fastened to the rear end of *g g*, to draw said clamps together at the back, thus spreading them at the front and releasing the boxes. The operator wheels the truck up to the pile of cheese, presses down lever *h*, tips the truck so as to about balance, when it can easily be wheeled along—carrying a load of from 350 to 400 pounds—by means of handles *l l*, which are braced with braces *m m*.



## CLOVE PICKING IN EAST AFRICA.

THE accompanying illustration shows natives of Zanzibar picking cloves for market. It may surprise some readers to see that the tree from which this spice is gathered is so tall as to require ladders for gathering the product. The tree is at least fifteen feet high, and it frequently attains a height of forty feet, and has a beautiful pyramidal head. The leaves are large and evergreen. The flowers—which, smoked and dried, form the cloves of commerce—are produced in the profusion common to the tropics. Not only the flowers, but the leaves and bark have an aromatic odor. The buds are gathered and dried by the smoke of wood fires, and afterward by the sun, or by the latter alone. The fruit sometimes appears in commerce in a dried state, under the name of "mother cloves;" it has an odor and flavor similar to cloves, but weaker. The clove tree is found in the Moluccas; also in Sumatra, Zanzibar, Mauritius, the West Indies, Brazil, and Guiana.



The aromatic qualities of the spice depend on two essential oils, which together form one-seventh of the weight of the cloves. The oil is obtained by repeatedly distilling with water, when two oils pass over—one lighter and the other heavier than water. The oil has a hot, acrid taste, is of a light yellow color when pure, and brown when not carefully prepared. It is a mixture of eugenic acid and a hydrocarbon isomeric with oil of turpentine. It is soluble in ether, alcohol, and the fixed oils are employed in medicine to check nausea and griping caused by the administration of purgatives, and as a remedy for toothache.

In Zanzibar, the average yield of cloves is twenty pounds per tree.

The industry has been hampered in that country, however, by the abolition of slavery, as there is now scarcity of labor. The climate is so mild and the growth of food plants is so luxuriant, that the native finds his wants readily supplied, and can with difficulty be induced to work.

In cultivating the clove, the seeds are planted in long trenches, and are

kept well watered until after sprouting. In the course of forty days, the shoots appear above ground. They are carefully watered and looked after for two years, when they should be about three feet in height. They are then transplanted, being set about thirty feet apart, and are kept watered until they become well rooted. From this time on, the young trees require only ordinary care, though the best results are obtained when the ground about the trees is well worked over and kept free from weeds.

The growth of the tree is very slow, and five or six years are required for it to come into bearing, when it is about the size of an ordinary pear tree.

When the buds assume a reddish color, the harvesting commences, and is prosecuted for fully six months at intervals, as the buds do not form simultaneously, but at odd times throughout this period. It will be seen from the photograph that the ladder used for gathering the cloves,

besides being primitive in construction, is of a peculiar three-sided shape. This is due to the fact that the limbs of the tree are so brittle that they could not endure the weight of an ordinary ladder.

## Pasteurization of Milk.

An international competition of apparatus for the pasteurization of milk will be held in the City of St. Petersburg, Russia, in the spring of 1904. Two premiums will be given, one of 1,500 rubles, amounting to about \$72.50, and a smaller one of 500 rubles, approximately \$25.

The apparatus must answer the requirements of a pasteurizer as well as a milk warmer, and have special devices for governing the temperature of heating, not only by means of a milk passage regulator, but also of a regulator for the admittance of steam or hot water.

Machines forwarded from abroad will be admitted free of customs duty, and participation in the trial safeguards the right of patenting the apparatus.

## New Oil Engine.

In a type of oil engine which has attracted much favorable notice the oil is vaporized and ignited without the use of any external source of heat. The main drawback has been that the engine would not run indefinitely with light loads, owing to the explosions not occurring with sufficient frequency to keep the igniting portion at a sufficiently high temperature. A modification of this type of motor just brought out by the Britannia Company, of Colchester, England, is claimed to be free from this drawback. The vaporizer is arranged, as usual, at the back of the cylinder. On the suction stroke, a vapor valve is opened by the cam shaft, and through this valve, air is drawn into the cylinder through the vaporizer, into which at the same time a little oil is sucked through an automatic valve. This mixture of air and oil is in itself too rich to be explosive, and the main supply of air is drawn through a separate air valve into the cylinder. Two passages connect the vapor valve with the cylinder. One of these is large and straight, while the other is narrow and U shaped. The lower portion of the U contains the igniter—a piece of metal having ribs, which enables it to absorb heat readily when the explosion takes place. This piece therefore becomes and remains red hot, while the rest of the vaporizer is only at a black heat. The vapor which is drawn through this igniter on the suction stroke is far too rich to burn, but on the compression stroke, air is forced back into the igniting piece and provides the necessary oxygen for the vapor already there to ignite. None of the exhaust passes through the igniter, which is consequently not cooled down in the case of a missed explosion. The proportion of oil and gas used is regulated by throttling the air supply. As already stated, part of this air is drawn through the vaporizer and the rest through the air valve. If the admission to the latter is throttled, a greater proportion of the air used will be taken through the vaporizer and will carry with it a proportionately greater amount of oil. The makers claim that, once started, the engine will run absolutely without attention for several hours.

## Purifying Water by Ozone.

Splendid results have recently been obtained at Wiesbaden and Paderborn in the purification of water by the use of ozonized air. Water of an inferior quality is thus turned into very good drinking water. Ozonizers of the Siemens type are used to treat the air.

The plant at Wiesbaden contains 48 of these ozonizers, forming duplicate groups of 24 each. A set of eight ozonizers receives an alternating current of 8,000 volts from a step-up transformer. One pole of the apparatus consists of the cooling water of the glass tube, and is earthed, while the other pole, connected to the transformers, is placed in an inaccessible position, and therefore causes no danger to the attendant. The ozonizing tubes are inclosed in a cast-iron case consisting of three parts: (1) A completely closed central portion, into which are firmly screwed the eight ozone tubes; (2) an upper part, acting as a reservoir and distributor of the air; and (3) a lower part, forming the ozone-collecting chamber. In the upper chamber, removed from all possible touch of the attendant, are fixed the terminals from the transformers. On the floor of the lower compartment are placed the high potential cylinders with their insulating glass rods, and in addition an automatic device to prevent a short-circuit through any leakage of the cooling water. This consists simply of a strip of filter paper stretched across a metal spring. If the filter paper gets moist it tears, the spring opens out and automatically places the particular ozonizer off duty.

To keep themselves posted in the progress of the art in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

## PATENTS

Send Your Business Direct to Washington . . .  
. . . Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office is close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-THREE YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

**INVENTIVE AGE**

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

**E. G. SIGGERS,** 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Messrs. James A. and David F. Youngblood, San Antonio, Texas, Inventors: The Southern Structural Steel Co., San Antonio, Texas, assignees. Five patents.—The invention of James A. Youngblood is a portable jail to be used in transporting and holding convicts employed in work on roads and the like. The jail consists of a latticed or grated body supported on wheels and having an enlarged central portion that extends above and below the main body. In this enlarged portion is located the door, which is also constructed of grating. The contracted portions of the body constitute the sleeping compartments and are subdivided by horizontal platforms into upper and lower bunks. The central enlarged portion is unoccupied by these platforms and thus permits the prisoners to stand upright in dressing.

The four other inventions are the work of Mr. David F. Youngblood. The first of these is a locking system for jail doors. In most large jails, the cell doors open into a long corridor or passageway, which, in turn, is closed at its ends by another locked door. The object of the present invention is to provide means which will permit the unlocking of all the doors of a series of cells, or any of such doors, so that all the prisoners may be simultaneously released into the corridor, or any one or more can be locked while the others are released, this operation, moreover, being performed by a guard who is entirely outside of the corridor. To this end each door is provided with a vertically moving locking bar, operated by a longitudinally disposed bar located above the same. This operating bar extends to a point outside the corridor, where there is located a lever having means which will permit the attachment of any or all of the bars. Thus, when all the bars are connected to the lever, and said lever is swung, all the cell doors will be unlocked; but if any of the operating bars are disconnected from the lever, the door associated with such bar remains in locked condition. The doors, moreover, are locked in their open position, so that there is no danger of the prisoners prying them loose or injuring them after they have been released. The structure is entirely efficient in operation and is so arranged that it is very secure. Means of a somewhat similar nature are employed for securing the corridor door, this corridor door securing means being located adjacent to the lever, which operates the locks for the cell doors.

Another patent granted to Mr. David F. Youngblood is on a lining for cells, vaults, and the like. The insertion of cell linings heretofore has been an extremely difficult job, as it is very hard to secure the wall sheathings permanently to the floor sheathings by rivets or the like. This will be evident when it is considered that the wall sheathings must extend from the ceiling to the floor, and it is, therefore, impossible to obtain the necessary space under the floor to hold the rivets. It has been the custom heretofore to make the connections with patch bolts or screws and this has decided disadvantages, among which may be mentioned the expensiveness of threading each opening and the cost of the screws. Furthermore, the joint so formed is insecure. In the present invention, the wall lining is made up of sections having inwardly extending flanges at their coacting ends, which flanges may be riveted together; thus, the bottom can be first placed within the cell and elevated, the lower section of the wall sheathing being afterwards riveted

thereto. The floor is then lowered to position and the remaining wall sections are put in place, the flanges being finally riveted together. This is an important advance in this style of structure.

The third patent relates to a construction of grating which consists of cross bars so arranged that the necessity of separate locks or rivets for securing said bars together at their intersections is obviated, the bars moreover being shorter and consequently stiffer to withstand any lateral strains. To this end, the bars are disposed diagonally with respect to each other, one set having diagonally arranged openings through which the other set passes.

The last patent of the series is a jail hammock support. These hammocks are ordinarily made of duck or similar fabric and are supported by straps, several of which are bolted to each end and are secured to the walls of the cells. These supports have proven objectionable as the material becomes torn and the straps wear. Moreover, if the hammock becomes soiled or infected, before it is washed the supporting devices must be removed, and this consumes considerable time. The support invented by Mr. Youngblood consists of a pair of metallic clamps having serrated inner faces which are adapted to engage and securely hold upon the fabric. These clamp plates are connected by a bolt, and one is provided with a downturned hook adapted to engage an eye attached to the wall of the cell.

Davis Barnard, Bakersfield, Cal. Gas Generator.—Two patents have been obtained on acetylene gas generators by the above inventor and both have been assigned to Dave Barnard and Company, who are the sole owners and manufacturers of the apparatus covered thereby. In the first case a generating chamber is employed, upon which is supported a carbid reservoir. Communication between them is controlled by a downwardly opening plug valve. This valve is carried by a vertical stem extending through the carbid reservoir and above the top of the same. A lever connected at one end to the carbid reservoir has an intermediate portion attached to the valve stem, and a coiled spring surrounding the stem bears against the lever, thus normally holding the valve in closed position. The gasometer comprises the usual water tank and bell and the latter is provided with an upstanding stem or rod carrying at its upper end a pulley. Over this pulley passes a rope, one end of which is attached to the aforementioned lever, the other end carrying a weight. A pin fastened to the upstanding rod constitutes a stop against which the lever abuts. Thus, as the bell raises or lowers, the valve will be closed and opened, and should an abnormal amount of gas be generated, the bell can move upwardly because of the cord and weight connection between the stem and the lever.

The other apparatus is particularly intended for use on cars and other vehicles, wherein there is considerable sway that would cause the water to splash about. In this instance the gas generator is surmounted by the carbid chamber, and the feed of carbid is controlled by a downwardly opening plug valve. The gas generator chamber is provided with a series of vertically disposed partitions that thus subdivide the chamber into a number of small compartments, which prevent the splashing of the water. The gas reservoir or gasometer partially surrounds the generator and comprises a semicircular tank, in which is located a semicircular vertically movable bell. A partition located in the tank subdivides the body of water and thus prevents splashing. The gas bell carries a hood which overhangs the carbid reservoir, and the valve stem is provided with a cross arm to which are connected ropes. These ropes pass over pulleys journaled on the hood and carry weights at their free

ends, movably located in wells formed in the generating chamber. The result of the arrangement is a compact structure, for the purpose set forth, which is entirely efficient in operation.

Charles Fred Luquer, Montgomery, N. Y. Canal Lock Gate.—This device is constructed on scientific principles, and is particularly interesting at this time because of the attention which is being given to canal construction in connection with the projected Isthmian Canal. The gate is composed of a series of relatively movable sections, raised and lowered by operating mechanism, as for instance, a motor supported at one side of the canal. These sections are moved in succession so that the release of the water is comparatively gradual. Subsidiary closures in the form of wickets carried by the gate are first opened when the gate operating mechanism is put in motion, and after the pressure of water is thus relieved to some extent, the gate is contracted by the relative movement of its sections until the lock is completely opened. After the gate sections have reached the limit of their individual or relative movement, the entire gate structure is moved upwardly to avoid any interference with the traffic on the canal.

Frank W. Colwell, Matteawan, N. Y. Design for Spoon.—The feature of the new design resides in the ornamental handle and bowl, the latter containing in relief a view of Beacon Mountains located at Matteawan, N. Y., together with the casino, inclined railroad, depot, and power house thereon. The handle is ornamentally decorated and is provided at the end opposite the bowl with a representation in relief of a monument located on the Beacon Mountains. The result is a design of pleasing and ornamental effect.

Stephen P. Rush, Tyrone, Pa., inventor: John L. Troutwine and Harry E. Seeds, assignees. Railway Chair.—The object of the present invention is to provide efficient means for securing the abutting ends of rails together, without the necessity of bolts and nuts, this means constituting a bridge across the joint, thus obviating the wear on the ends of the rails and the shocks imparted by the passage of the wheels thereover. The rails are provided with recesses in their abutting ends, and a base is arranged transversely beneath said ends. This base has a rail-engaging abutment at one end and an upstanding hook at the other end. A holding block is slidably mounted on the base and comprises a neck having an upstanding head fitted in the recesses and bridging the joint between the rail. Wings extend in opposite directions from the head and fit in the channels of the rails. A key is interposed between and engages the upstanding hooks of the base and holding block, and a locking tongue is carried by the key and engages the upstanding hook of the base to hold the key against displacement.

Jesse Y. Shallenberger, Weldon, Ill. Compound Tool.—The tool is convenient for a variety of purposes and yet is extremely simple in construction. Lever arms are pivotally connected between their ends, the portions of the arms on one side of the pivot constituting coacting jaws that are offset. One of these jaws is provided with a notch which constitutes a tack puller. The opposite end of one arm is sharpened to form an opening knife, and a hook secured to the inner side of this arm contiguous to its sharpened end constitutes a fulcrum for the arm when employed in opening a can. The free end of the hook extends toward the pivot, and thus may be employed for lifting various articles. The lever arms are preferably formed of sheet metal and are twisted between their ends, so that the portions on opposite sides of the pivot are located in angular relation.

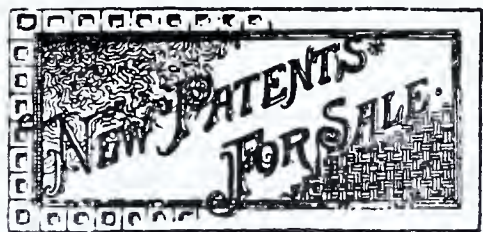
Henry E. Marsh, New Haven, Conn. Pipe Union.—In the structure illustrated in the patent, two pipe members are employed which are in the form of internally threaded sleeves, one of the members having an enlarged exteriorly threaded end, the coacting end of the other member being provided with an annular exterior flange. The adjacent ends of the members are correspondingly beveled, and between them are fitted washers, comprising collars that engage in the ends of the members and have outstanding bearing flanges that are inclined to correspond to the bevel of the faces. These washers are preferably constructed of sheet metal, and are formed of suitable non-corrodible material, such as zinc, copper, brass, or the like. The members are secured together by a coupling nut threaded upon the enlarged portion of one member and having an intumed annular shoulder that coacts with the outstanding flange of the other member. Between the flange and shoulder is interposed a washer. This structure affords a secure liquid-tight joint, which will not become corroded and in which the parts will not stick together.

Eugene N. Manzer, Beatrice, Nebraska, inventor: A. J. Roberts and W. H. Miller, Lincoln, Nebraska, assignees. Can Opener.—In this patented structure, the can is firmly held by the machine while being cut. A standard is employed which is composed of slidably mounted sections, the lower of which can be attached to a table or other support. The lower section has an outturned arm on which is adjustably and rotatably mounted a top cutting device. This device comprises a lever having one end downturned and sharpened to constitute the cutter, the other end being provided with an upstanding handle. The lever is slotted and through this slot passes a bolt, constituting an adjusting device, as well as a pivot for the lever. The sections are adjusted by means of another lever attached to a bracket forming a part of the lower section, and having a connection with the upper section by means of a link. In use, the can is placed beneath the outstanding arm, the lever is moved downwardly, thus carrying the arm of the upper section, and directing the cutting knife into engagement with the same, whereupon by turning the upper lever, the top is cut.

James S. Lester, Atlanta, Georgia. Burial Vault.—The invention relates more particularly to that class of structures employed as burial vaults, and the object is to provide a building of this character which will withstand the ravages of time, the parts and elements being so arranged and combined that portions subject to the deleterious influences and action of the elements will be protected from the same. The outer walls are constructed of marble or other suitable material, comprising pilasters, between which are fitted slabs. The roof consists of a two-part block, the joint being covered with a ridge-piece. The interior fittings are also of marble slabs, and between the same and the outer casing is a filling of brick. The interior is subdivided into various compartments opening into a vestibule at the front.

Lambert A. J. Muller-Thym, New York, N. Y. Sign.—This is an important improvement in illuminated signs. The face of the same consists of sheet metal having raised letters, which are cut out in the shape of the same, at the same time forming intumed flanges constituting seats for suitable transparent material, as glass. This material is fastened in place by metallic lips. The flanges have their inner faces coated with reflecting material, and thus when the sign is illuminated, each letter is bordered by a line of increased light, producing a more attractive and ornamental sign.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 722,092, March 3, 1903. Stop Cock for hot or cold water drawn with one handle. \$10,000, or shares stock company. Address, P. R. Fern, Latrobe, Pa. dec

**FOR SALE**—United States patent No. 724,819, Rotary Motor. Combines the wedge, screw and lever advantages in a powerful, economical, and durable compound motor or engine without a dead centre. Address, James M. Crowley, Carl Junction, Mo. dec

**FOR SALE**—Patent No. 729,925, dated June 2, 1903. Farm Gate. Can be manufactured very cheaply. The hanger may be placed on any wood gate, and give it a rolling movement. Price \$600. For drawings and particulars, address, Daniel J. Fuller, Oxford, Indiana dec

**FOR SALE** or on royalty—Patent No. 680,755 dated August 20, 1901 Patent No. 733,454, dated July 14, 1903 Corn Cutter and Crusher. Will crush three bushels of corn a minute with two H. P. Can be manufactured for about one-third selling price. Address, J. S. Bloom, Winthrop, Iowa. dec

**FOR SALE** or on royalty—Patent No. 682,257, November 10, 1902. Device for marking the ears of cattle. It cuts the owner's initials in the ears of the animal. For particulars address, Jacob Hinz, Jr., Canistota, S. D. dec

**FOR SALE**—Patent No. 734,003, Tire Setter and Cooler. Best thing out. Fills a long-felt want. Write to J. B. Preston, Rushville, Ill., for particulars. dec

**FOR SALE**—Patent No. 725,682, dated April 21, 1903 Novel pawl for looms or any place where pawl and ratchet are used. Perfected and in use. Money in it for the right man. Send for cut and testimonials. Address, I. W. Doeg, Newmarket, N. H. dec

**FOR SALE**—Patent No. 715,678, Napkin Holder. Prevents soiling the clothes, is easily adjusted to the body, and not expensive. For further particulars write to L. J. Martin, Orange, Va. dec

**FOR SALE**—Patent No. 532,072. One-half interest in patent funnel and measure, patented January 8, 1895. Will sell cheap. Address, Lafayette Palmer, No. 1724 Penn. Street, Harrisburg, Pa. dec

**FOR SALE**—Patent No. 709,024, dated September 16, 1902 A valuable patent. An illuminated street car sign. Will sell state right, shop right, or on royalty. Also Canada patent for same to sell outright. For further particulars, address John Lorich, Jr. Williamsville, N. Y. nov

**FOR SALE**—Patent No. 735,251, dated August 4, 1903. Bolt Holding Implement. A useful tool for blacksmiths, wagon and carriage repairers; also for farmers for repairing farm machinery. Address, Julian R. Harrison Barnwell, S. C. nov

**FOR SALE**—A recently patented practical fence stay, to be used between posts on wire fences. Is light, durable, strong and cheap. Prefer to sell outright. Specifications, drawings and price furnished to interested parties on application. Address, Chas H. Senour, Dripping Springs, Texas, nov

**FOR SALE**—Patent No. 732,231, dated June 30, 1903. Postless Wire Fence and Telephone combined. This fence consists of endless cable stay. Inventor will warrant same to be durable and reliable. Address, M. H. Starling, Roxbury, Ohio. nov

**FOR SALE**—Patent No. 731,061, dated June 16, 1903. The automatic cattle proof mail box. Approved by Postmaster-General. The best rural box made. Address, C. F. Mackenzie, Shell, Wyo. nov

**FOR SALE**—Patent No. 721,425, dated Feb. 24, 1903. Adjustable support for fire arms, fishing poles, artists umbrellas, etc. Can be made to fit any gun or rod. For particulars, address R. N. Clyde, Shelter Island, N. Y. nov

**FOR SALE**—Patent No. 730,694, dated June 9, 1903. The most practical washing machine ever produced; the product of forty years experience. I challenge the world on two minute work; grand opportunity for investors. Address, O. E. Peterson, South Glen Falls, N. Y. nov

**FOR SALE**—Patent No. 724,953. Improved Fire Ladder: can be used as a fire escape, a water tower and an extinguisher. No reasonable offer refused. Address, John C. Schaller, Hastings-on-Hudson, N. Y. nov

**FOR SALE**—Patent No. 732,985. Schedule and Train Calculating Machine. United States right \$50,000. Address, J. M. Wilson, Jr., Graysville, Ga. (nov)

**FOR SALE**—Patent No. 733,571, dated July 14, 1903. Necktie. Contains special improvements in sewing and fastening. For price of entire right and plan of manufacture address, Otto Wm. Peterson, Bertrand, Nebr. (nov)

**FOR SALE**—Patent No. 734,360, dated July 21, 1903. Fastening for shoes with new improvement. For sale or on royalty. Address, F. Paschen, Tampa, Fla. nov

**FOR SALE**—Patent No. 719,170, dated Jan. 27, 1903. Folding Camp Chair. Possesses great advantages over other camp chairs. Address, Eli T. Zimmerman, Mansfield, Ohio. oct

**FOR SALE**—Patent No. 728,945, dated May 26, 1903. Ratchet Pipe Wrench. Any one may send in his offer for any state, county, or shop right, or the entire right. Highest bidder will secure the patent right. Address, Joseph Levy, Verdigris, Nebr oct

**FOR SALE**—Patent No. 727,442, May 5, 1903. Hoisting device. Cheap in construction, double acting; for use inside or outside of buildings. Address, Michael Rath, Two Rivers, Wisconsin. oct

**FOR SALE**—Patent No. 708,736. Round Axle Ball-bearing Fixture for Shade Rollers, Carpet Sweepers, Awning Rollers, etc. For full particulars address, John Renner, 612-614 Jefferson St., Burlington, Iowa. oct

**FOR SALE**—Patent No. 726,752, dated April 28, 1903. Ship's Table. Always remains horizontal, no matter how the ship rolls or pitches. Address, William J. Preater, 224 Franklin Street, Elizabeth, N. J. oct

**FOR SALE**—Patent No. 726,610. Bicycle Canopy. Every bicycle made needs a canopy. Will sell outright or lease on royalty. For full description address, Martin Zech, Prairie du Sac, Wis. oct

**FOR SALE** or on royalty—Patent No. 731,922. Display Rack for lace curtains, bed spreads, etc. In cabinet form on casters; easy to move around; cabinet 20 inches deep; holds 42 hanger arms; can be made in any size. Also Canadian patent. Address, Lindquist & Agle, Argyle, Minn oct

**FOR SALE**—Patent No. 727,204, dated May 5, 1903. Rogers Spectacle Holder. Will sell part or on royalty. Only device for carrying spectacles when not in use. Does away entirely with a clumsy case. Rare chance for some one. Address, A. W. Rogers, Fort Myers, Florida. oct

**FOR SALE**—Patent No. 721,532, dated Feb. 24, 1903. Sheet-music Cabinet. Makes it just as easy to handle 500 pieces as to handle five. For simplicity and convenience, has no equal. Address, C. P. Baron, Haymond, Franklin County, Indiana. oct

### WANTED.

**WANTED**—Agents to sell state and county rights for my wire reel apparatus. Patent No. 726,855, dated May 5, 1903 Address, Jesse W. Brooks, Churchhill, Texas. oct

**WANTED** to have manufactured, or will sell on royalty plan. Patent No. 733,840, dated July 14, 1903. Heating device (cooking drum,) the best thing now in use. Saves time, labor and wood. Nothing so cheap and convenient. Cooks to perfection. Write for particulars. J. W. Howell, 804 East F street, Hillsboro, Texas. (nov)

### NOTICE TO MANUFACTURERS.

I have just had a new Lap-Ring patented; on what terms can I get it manufactured. Answer at once please: Thomas Cotten, Linn, Miss. dec

### Magic Rheumatic Cure!

It absolutely does cure. It is not a cheap remedy but it is a cheap cure. Mark the distinction! There are a thousand remedies to one cure. This is a CURE. It costs \$2.00 a bottle, and is worth \$20.00 to any sufferer. Sold only by our authorized agents or direct of us. Send for circular. Agents wanted.

### MAGIC CURE CO.

R. 313-315 Dearborn St. Chicago.

### ...SILK...

A JOURNAL PUBLISHED MONTHLY.

Devoted exclusively to the Raising of SILK and the Manufacture of the same. Only one dollar (\$1.00) a year.

Subscribe now. It contains information you ought to know.

Address,

**SILK PUBLISHING COMPANY.**

Tallulah Falls, Georgia.

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

### A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever Issued. The ARMY AND NAVY MAGAZINE, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00

## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America.

For rates, address—

The Railway and Engineering Review, 1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,

Send for sample copies. ALLENTOWN, PA.

## SELF-EDUCATION

FOR MECHANICS.

A Monthly Journal intended as a Guide to Correct Methods in Work and Study.

25c. A YEAR. SAMPLE COPY FREE

Industrial Publication Co.,

16 Thomas Street, - - NEW YORK.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

FRED. B. NICHOLS & CO.,

913 E St., N. W.,

Wholesale Stationers, Washington, D. C.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— The Inventive Age Pub. Co.,

918 F St., N. W. WASHINGTON, D. C.

**E. C. WILEY,**  
**Mechanical = = = Engineer,**  
Office 811-1-2 Main Street,  
Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.



Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING Co., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

## "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O.....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, OCTOBER, 1903.

### Proposed Amended Trade Law.

In another column of the AGE we print the report of the Committee on Patent, Copyright and Trade-Mark Law, which was presented at the meeting of the American Bar Association at Hot Springs, Va., commencing August, 27, 1903.

The AGE has previously referred to the Commission appointed by Congress several years ago to revise the patent and trade-mark laws of the United States; and made special reference to the report prepared by Mr. A. P. Greeley, one of the members of said Commission. The Commission was composed of Judge Grosscup, Francis Forbes, Esq. and A. P. Greeley, Esq.

Two bills were presented to Congress as a result of the deliberations of the Commission, one by the majority composed of Messrs Grosscup and Forbes, and the other by Mr. Greeley. Neither bill has been acted upon by Congress. It is an exceedingly high compliment to Mr. Greeley that his bill has now every chance of becoming a law, for it has been recommended by the American Bar Association, and such endorsement has heretofore sufficed before Congress.

It must be admitted that the present trade-mark law is defective. Amendment has been needed in this direction for years. It is singular, considering the vast interests involved, how long this matter has been allowed to drag without action. It looks at present, though, that the matter of delay were a thing of the past.

One of the beneficial provisions of the new law is the reduction of the fee for registration with a reduction in the term of registration. The registration fee is fixed in the bill at \$10, and the term of years ten. The bill also specifies and limits the power of the Commissioner to reject applications, and provides for a criminal remedy for the wilful forgery and utterance of a registered trade-mark. The bill also provides for an appeal to the Court of Appeals of the District of Columbia, which appeal will do much toward giving stability to the law of trade-marks.

Under the present law the registra-

tion of a trade-mark is not absolutely essential. The new law will change this, and make it necessary for all trade-marks to be registered.

The Association made one change in the bill, the wisdom of which will be conceded by everyone. The registration of trade-marks is taken from the Patent Office and transferred to the Department of Commerce and Labor, which has recently been created. This was indeed a very happy suggestion on the part of someone, for the withdrawal of the trade-mark cases from the Patent Office will relieve the congestion in that office, and the new Department will not be hampered by time-worn precedents in the consideration of trade-mark cases.

No man has done more toward securing the enactment of a proper trade-mark law than Mr. Greeley, and if his efforts are finally crowned with success, he deserves the thanks of everyone transacting business under a trade-mark, and the esteem of his fellow practitioners.

### REPORT

of the

### COMMITTEE ON PATENT, TRADE-MARK AND COPYRIGHT LAW.

Presented at the meeting of the American Bar Association of Hot Springs, Va., August 27, 1903.

### TRADE-MARK LAW.

To the American Bar Association:

At the last session of the Patent Section of the American Bar Association the following resolution was adopted:

"That it is the sense of the Patent Section of the American Bar Association that a comprehensive national trade-mark law should be enacted by Congress which will provide for the registration in the United States Patent Office of trade-marks used in interstate commerce as well as in foreign commerce, and also contain provision to fulfill certain treaty obligations which have been entered into by the United States government with foreign nations on the subject of trade-marks.

"Therefore, it is resolved that the Standing Committee on Patent, Trade-mark and Copyright Law be, and they are hereby requested to frame a bill containing provisions as above indicated and report such bill to the next meeting of this Section, having previously complied with the requirements of the by-laws of this Association as to printing and distribution of the Committee's report before the meeting."

In compliance with this instruction the Standing Committee took up the question of the preparation of a bill for the registration and protection of trade-marks used in foreign and interstate commerce or with the Indian tribes.

They found pending before Congress two bills which had been prepared, one by the majority of the Commission appointed by Congress to revise the Patent and Trade-mark Laws of the United States, and the other by a minority of that commission.

The Committee studied these two bills carefully and reached the conclusion that the minority bill was more closely in accord with the spirit of the American Law of Trade-marks than the majority bill, and, therefore, the preferable one of the two.

The bill prepared by Mr. Greeley of the Commission, as the minority bill, did not, however, contain any criminal remedy for the wilful forgery and utterance of a registered trade-mark.

The opinion of the Committee upon this subject cannot be better expressed than by quoting the language of the

Senate Committee in making its report upon House Bill No. 3109, relating to pure food. The Committee said:

"Believing that counterfeit goods which are traded for honest dollars should be placed under the same ban as counterfeit dollars traded for honest goods, this Committee recommends that the Bill H. R. 3109 do pass."

The Committee is of the opinion that criminal clauses should be added to the bill prepared by Mr. A. P. Greeley. This has been done, and the following bill is Mr. Greeley's bill with civil and criminal clauses altered and added.

The purpose of the bill is to secure the registration in the United States Patent Office of all trade-marks in use by citizens of the United States or foreigners selling their goods in the United States; and for this purpose it removes all restriction and jurisdiction of the Commissioner of Patents to reject applications for registration of trade-marks upon the grounds usually relied upon under the present act by that officer and his subordinates.

The bill specifies in Section 5 the grounds upon which an application may be rejected and limits the power of the Commissioner to reject applications on the following grounds:

1. Immoral or scandalous matter.
2. Flag or coat of arms or other insignia of the United States, or any state or municipality, or of any foreign nation.
3. Marks identical with any registered trade-mark for the same class of merchandise.
4. Marks identical with any known trade-mark for the same class of merchandise, whether registered or not.
5. The mere name of an individual, firm, corporation or association.
6. Words or devices merely descriptive of the goods with which they are used, or the character or quality of the same.
7. The name of a locality, unless coupled with a disclaimer admitting the rights of others doing business in the same locality.

Every other form or character of name, mark or device used by a manufacturer, trader or other person, firm or corporation, as a trade-mark, may be registered and cannot be refused registration by the Commissioner of Patents. The fee for registration is reduced to ten dollars, and the term of registration is ten years.

There are certain clauses carefully drawn to bring the legislation of the United States into accord with treaties which the United States has made with foreign nations.

The remedial clauses of the act are divided into two general classes. Certain of the sections provide for civil remedies and other sections for criminal remedies. The civil sections as well as the criminal sections relate to two classes of cases:

1st. Cases in which the acts of the defendant are committed in interstate commerce, and

2d. Cases in which the trade-mark is used by the owner in interstate commerce, and the acts of the defendant are such as to interfere with that commerce.

Sections covering both of these classes of cases have been drawn so as to be complete in themselves and entirely independent of each other, in order that, if one set should fall because not within the commerce clause of the Constitution, the others may stand and afford some remedy in a limited class of cases.

Respectfully submitted,  
EDMUND WETMORE, *Chairman.*

### A BILL

### TO REVISE THE LAWS OF THE UNITED STATES RELATING TO TRADE-MARKS.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That any person claiming to be the owner of a trade-mark used in commerce among the several states, or in commerce with foreign nations or with the Indian tribes, provided such person is domiciled within the territory of the United States, and any person claiming to be the owner of a trade-mark, who is located in any foreign country, which by treaty, convention or law, affords similar privileges to citizens of the United States, may, upon payment of the prescribed fees, and otherwise complying with the requirements of this act, obtain registration therefor.

SEC. 2. That before any owner of a trade-mark shall be entitled to registration thereof he shall make application therefor in writing to the Commissioner of Patents, and shall file in the Patent Office a statement signed by him specifying his name, domicile and citizenship, and the location of his industrial or commercial establishment, the class of merchandise and the particular description of goods comprised in such class to which the particular trade-mark has been appropriated, a description of the trade-mark itself, if considered necessary by the applicant or required by the Commissioner in the particular case: a statement of the mode in which the trade-mark is applied to goods, and a statement of the length of time during which it has been used. With this statement shall be filed a facsimile drawing of the trade-mark, signed by the applicant or his attorney in fact, and such number of specimens of the trade-mark as actually used, as may be required by the Commissioner of Patents.

SEC. 3. That the application required by Section 2 of this act, if made by the owner of a trade-mark domiciled within the territory of the United States, shall be accompanied by a written declaration, verified by the applicant, that he believes himself to be the owner of the trade-mark sought to be registered, and that no other person, firm, corporation or association has a right to use such trade-mark, either in the identical form or in any such near resemblance thereto as might be calculated to deceive; that such trade-mark is used in commerce among the several states, or in commerce with foreign nations or with the Indian tribes, and that the facsimile drawing and specimens, if any, truly represent the trade-mark sought to be registered. The application, if made by the owner of a trade-mark located in a foreign country, shall be accompanied by a written declaration, verified by the applicant, that he believes himself to be the owner of the trade-mark sought to be registered; that he has registered the same, or has regularly filed an application for registration thereof in the foreign country in which he is located, of which registration or application, as the case may be, he shall state the date; that no other person, firm, corporation or



association has the right to use such trade-mark, either in the identical form or in any such near resemblance thereto as might be calculated to deceive, and that the facsimile drawings and specimens, if any, truly represent the trade-mark sought to be registered.

In case the owner of the trade-mark is a firm, corporation, association, state or municipality the declaration may be made by a member of the firm or an officer of the corporation, association, state or municipality.

The declaration required by this section may be made before any person within the United States authorized by law to administer oaths, or, when the applicant resides in a foreign country, before any minister, *charge d'affaires*, consul or commercial agent holding commission under the government of the United States, or before any notary public, judge or magistrate having an official seal of the foreign country in which the applicant may be.

SEC. 4. That every applicant for the registration of a trade-mark not domiciled in the United States shall, before the issuance of the certificate of registration, designate by a notice in writing filed in the Patent Office some person residing within the United States on whom process or notice of proceedings affecting the right of ownership in the trade-mark of which he may claim to be the owner, brought under the provisions of this act or under other laws of the United States may be served with the same force and effect as if served upon the applicant or registrant in person.

SEC. 5. That no mark by which the goods of the person claiming to be the owner of the mark may be distinguished from other goods of the same class, shall be refused registration as a trade-mark on account of the nature of such mark, unless such mark,

(a) Consists of or comprises immoral or scandalous matter.

(b) Consists of or comprises the flag or coat of arms or other insignia of the United States, or any simulation thereof, or of any state or municipality, or of any foreign nation.

*Provided*, That marks which are identical with a registered or known trade-mark owned or in use by another, and appropriate to the same class of merchandise, or which so nearly resemble a registered or known trade-mark owned and in use by another, and appropriate to the same class of merchandise as to be likely to cause confusion or mistake in the mind of the public, or to deceive purchasers, shall not be registered. And

*Provided*, That marks which consist merely in the name of an individual, firm, corporation or association, not written, printed, impressed or woven in some particular or distinctive manner, or which consists merely in words or devices which are descriptive of the goods with which they are used, or of the character or quality of such goods, or which consist of the name of a locality, shall not be registered, unless the applicant for registration states in his application that he makes no claim to the exclusive use of such mark as against others who may use the same without fraudulent or deceptive intent.

SEC. 6. That any application for registration of a trade-mark filed in

this country by any person who has previously regularly filed in any foreign country which by treaty, convention or law affords similar privileges to citizens of the United States, an application for the registration of the same trade-mark shall be accorded the same force and effect as would be accorded to the same application if filed in this country on the date on which application for registration of the same trade-mark was first filed in such foreign country, provided such application is filed in this country within four months from the date on which the application was first filed in such foreign country.

SEC. 7. That on the filing of any application for registration of a trade-mark which complies with the requirements of Sections 2 and 3 of this act, and the payment of the fees required by this act, the Commissioner of Patents shall cause an examination thereof to be made; and if on such examination it shall appear that the applicant is entitled to registration under the provisions of this act, the Commissioner shall issue a certificate of registration therefor.

SEC. 8. That whenever, on examination, an application for registration of a trade-mark is refused, the Commissioner shall notify the applicant thereof, giving him briefly the reasons for such refusal, together with such information and references as may be useful in judging of the propriety of persisting in, modifying or abandoning his application; and if, after receiving such notice, the applicant persists in his claim of right to registration, either with or without modifying his application, his application shall be re-examined.

SEC. 9. That upon failure of the applicant to complete his application for registration within one year after the filing of any part thereof, or upon his failure to prosecute his application within one year after any action therein, of which notice shall have been given to the applicant, such application shall be regarded as abandoned, unless it be shown to the satisfaction of the Commissioner that such delay was unavoidable; but the abandonment of such application shall not be construed to be an abandonment of any right to the trade-mark for the registration of which such application was made.

SEC. 10. That whenever application is made for the registration of a trade-mark which is substantially identical with a trade-mark appropriated to the same class of goods for which a certificate of registration has been previously issued to another, and is still in force, or for registration of which another has previously made application, or which so nearly resembles such trade-mark as, in the opinion of the Commissioner, to be likely to be mistaken therefor by the public, and the applicant shall show, to the satisfaction of the Commissioner, that he used the trade-mark of his application prior to the date of filing of the application on which such previous registration was granted, or the date of filing of such prior application, as the case may be, or shall show to the satisfaction of the Commissioner that the registrant or prior applicant has abandoned the use of such trade-mark, the Commissioner shall suspend such later application and give notice thereof to the registrant or prior applicant, as the case may be. If within such time, not less than thirty days from such notice as the Commissioner shall prescribe, the registrant or prior applicant files in the Patent Office notice of opposition to the grant of such application, stating the reasons therefor, the Commissioner shall declare that an interference exists as to such trade-mark, and shall direct examiner in charge of interferences to determine the question of ownership of such trade-mark. And the Commissioner may issue a certificate of registration to the party who is adjudged to be the owner of the trade-mark, unless the adverse party appeals from the

decision of the examiner in charge of interferences within such time, not less than twenty days, as the Commissioner shall prescribe. If the registrant or prior applicant, after due notice, shall fail to file notice of opposition within thirty days, the Commissioner may issue a certificate of registration to the later applicant.

SEC. 11. That every applicant for the registration of a trade-mark or for the renewal of the registration of a trade-mark whose application has been twice refused, and every party to an interference as to a trade-mark, may appeal from the decision of the examiner in charge of trade-marks, or of the examiner in charge of interferences, as the case may be, to the Commissioner in person, having once paid the fee for such appeal.

SEC. 12. If an applicant for registration of a trade-mark, or such party to an interference as to a trade-mark, is dissatisfied with the decision of the Commissioner of Patents, he may appeal to the Court of Appeals of the District of Columbia on complying with the conditions required in case of an appeal from the decision of the Commissioner by an applicant for patent or a party to an interference as to an invention.

SEC. 13. That the Commissioner of Patents is authorized to record in the Patent Office the transfer of the property right in any registered trade-mark, or in any trade-mark for which application for registration has been made. But no such transfer of a trade-mark shall be recorded unless it shall appear that such transfer was made with, or as a part of, a transfer of the good will of the business in which such trade-mark was used. Any transfer of the good will of the business in which a particular trade-mark is used, shall be deemed a transfer of such trade-mark, and may be recorded unless the parties thereto expressly stipulate to the contrary.

SEC. 14. That certificates of registration of trade-marks shall be issued in the name of the United States of America, under the seal of the Patent Office, and shall be signed by the Commissioner of Patents, and a record thereof, together with printed copies of the drawings, statement of the applicant, and description, if any, shall be kept in books for that purpose. The certificate shall state the date on which the application for registration was deposited in the Patent Office. Certificates of registration of trade-marks may be issued to the assignee of the applicant; but the assignment must first be entered on record in the Patent Office. Written or printed copies of any records, books, papers or drawings relating to trade-marks, belonging to the Patent Office, and of certificates of registration authenticated by the seal of the Patent Office and certified by the Commissioner or acting commissioner thereof, shall be evidence in all cases wherein the originals could be evidence; and any person making application therefor and paying the fee required by law shall have certified copies thereof.

SEC. 15. That a certificate of registration shall remain in force for ten years, except that in case of trade-marks previously registered in a foreign country, such certificates shall cease to be in force on the date on which the trade-mark ceases to be protected in such foreign country and shall in no case remain in force more than ten years, unless renewed. Certificates of registration may be, from time to time, renewed for like periods on payment of the renewal fees required by this act upon request by the registrant, his legal representatives or transferees of record in the Patent Office, provided such request is made prior to the expiration of the term for which the certificates of registration were issued or renewed. Certificates of registration in force at the date at which this act takes effect shall remain in force for the term for which they were issued, but shall be renew-

able on the same conditions and for the same periods as certificates issued under the provisions of this act, and when so renewed shall have the same force and effect as certificates issued under this act.

SEC. 16. That the following shall be the rates for trade-mark fees:

On filing each original application for registration of a trade-mark, ten dollars.

On filing each application for renewal of registration of a trade-mark, five dollars.

On an appeal for the first time from the examiner in charge of trade-marks to the Commissioner of Patents, ten dollars.

On an appeal for the first time from the decision of the examiner in charge of interferences, awarding ownership of a trade-mark to the Commissioner of Patents, fifteen dollars.

For certified and uncertified copies of certificates of registration and other papers, and for recording transfers and other papers, the same fees as required by law for such copies of patents and for recording assignments and other papers relating to patents.

SEC. 17. Sections forty-nine hundred and thirty-five and forty-nine hundred and thirty-six, relating to the payment of patent fees and to the repayment of fees paid by mistake, are hereby made applicable to trade-mark fees.

SEC. 18. That the Commissioner of Patents may, from time to time, establish regulations not inconsistent with law for the conduct of proceedings in reference to the registration of trade-marks provided for by this act.

SEC. 19. That the registration of a trade-mark under the provisions of this act shall be *prima facie* evidence of ownership. Any person who shall, without the consent of the owner thereof, reproduce, counterfeit, copy or colorably imitate any such trade-mark, and affix the same to merchandise of substantially the same descriptive properties as those described in the registration, or to labels, signs, packages, wrappers, or receptacles intended to be used upon or in connection with the sale of merchandise of substantially the same descriptive properties as those described in such registration, and shall use the same in commerce with a foreign nation, or among the several states, or with the Indian tribes, shall be liable to an action at law for damages therefor, at the suit of the owner thereof; and the party aggrieved shall also have his remedy according to the course of equity to enjoin the wrongful use of such trade-mark in foreign commerce, or among the several states, or with the Indian tribes, in any court having jurisdiction over the person guilty of such wrongful act; and the Circuit Courts of the United States and the Supreme Court of the District of Columbia shall have original jurisdiction, and the Circuit Courts of Appeal of the United States and the Court of Appeals of the District of Columbia shall have appellate jurisdiction in such cases, without regard to the amount in controversy or the citizenship of the parties, and upon the decree being rendered in any such case for an infringement, the complainant shall be entitled to recover, in addition to the profits to be accounted for by the defendant the damages the complainant has sustained thereby and the court shall assess the same, or cause the same to be assessed under its direction, and whenever in any action a verdict is rendered for the plaintiff, the court may enter judgment thereon for any sum above the amount found by the verdict as the damages sustained, according to the circumstances of the case, not exceeding three times the amount of such verdict, together with costs. And in any case where a verdict has been found for the plaintiff, or an injunction issued, the court may order the delivery up, and the destruction of all labels, signs, packages, etc., upon which the defendant may have used



the trade-mark of the plaintiff, or complainant, or the colorable imitation thereof.

SEC. 20. Any injunction that may be granted upon hearing after notice to the defendant by the Circuit Court of the United States, or by a judge thereof, restraining and enjoining the infringement of any trade-mark registered under the provisions of this act, may be served on the parties against whom such injunction may be granted anywhere in the United States, and shall be operative and may be enforced by proceedings to punish for contempt or otherwise by any other Circuit Court or judge in the United States. The Circuit Court or judges thereof shall have jurisdiction to enforce said injunction, as herein provided, as fully as if the action were pending or brought in the circuit in which said motion was made.

The clerk of the court or judge granting the injunction shall, when required so to do by the court hearing the application to enforce said injunction, transmit without delay to said court a certified copy of all the papers on which the said injunction was granted that are on file in his office.

SEC. 21. Whenever a trade-mark, duly registered under and in accordance with the provisions of this act, shall be used by the owner thereof in foreign commerce or in commerce among the several states or with the Indian tribes, any person who shall, without the consent of the owner thereof, apply such trade-mark or a counterfeit copy or deceptive imitation thereof to merchandise of substantially the same class or description as described in such registration in any state or territory into which merchandise lawfully bearing said registered trade-mark is imported, or from which it is exported; or who shall apply such trade-mark to labels, signs, packages, wrappers or receptacles intended to be used upon or in connection with the sale of such merchandise in any such state or territory, or who shall knowingly sell or offer for sale in any such state or territory merchandise so marked or such labels, signs, packages or receptacles intended to be used as aforesaid, knowing such to be the intention; and who shall persist in either of these acts after being notified of such registration and requested to desist therefrom, shall be deemed guilty of contributing to impair the protection afforded by such trade-mark in foreign or interstate commerce or in commerce with the Indian tribes, and shall be liable to an action at law for damages therefor at the suit of the owner thereof, and the party aggrieved shall also have his remedy according to the course of equity to enjoin such unlawful use of such trade-mark, and all the wrongful acts herein specified, in any court having jurisdiction over the person guilty of such wrongful acts. The Circuit Courts of the United States and the Supreme Court of the District of Columbia shall have original jurisdiction, and the Circuit Courts of Appeal and the Court of Appeals of the District of Columbia appellate jurisdiction, both at law and in equity, in such cases, without regard to the amount in controversy or the citizenship of the parties, and the party aggrieved shall have the same remedy for the violation of the provisions of this section as are provided in Section 19 for the violation of the provisions of that section, and the same means of enforcement as therein set forth. But no suit or action shall be maintained under this section unless it appear that the party aggrieved, or his lawful predecessor in title, was, within one year preceding the suit of action, commercially using said trade-mark on or in connection with merchandise of the class or description specified imported into the states or territories where such wrongful act is committed, or exported therefrom, or in commerce with the Indian tribes.

SEC. 22. Whenever a trade-mark, duly registered under and in accordance with the provisions of this act, shall be used by the owner thereof in foreign commerce among the several states or with the Indian tribes, any person who shall without the consent of the owner thereof, and with intent to defraud, apply such trade-mark, or any counterfeit copy or deceptive imitation thereof, to merchandise of substantially the same class or description as described in such registration in any state or territory into which this merchandise lawfully bearing said registered trade-mark is imported, or from which it is exported, or who shall, with intent to defraud, apply such marks to labels, signs, packages, wrappers or receptacles intended to be used upon or in connection with the sale of said merchandise in any such state or territory, or who shall, with intent to defraud, sell or offer for sale in any such state or territory, merchandise so marked, or such labels, signs, packages or receptacles intended to be used as aforesaid, knowing such to be the intention, and who shall persist in either of these acts after being notified of such registration and requested to desist therefrom, shall, upon conviction thereof, be punished by a fine of not more than five hundred dollars or by imprisonment at hard labor for not more than one year, or by both such fine and imprisonment in the discretion of the court. And the Circuit Court of the United States for the district where such person may be found or the Supreme Court of the District of Columbia shall have original jurisdiction, and the Circuit Courts of Appeal and the Court of Appeals of the District of Columbia appellate jurisdiction of all cases, actions or prosecutions arising under this section of the statute, without regard to the amount in controversy or the citizenship of the parties. No person shall be liable under this section unless it appear that the offense has been committed in some state or territory where the registered trade-mark has within one year before such offense been lawfully used commercially on or in connection with merchandise of the class or description specified imported into such state or territory, or exported therefrom, or in commerce with the Indian tribes.

SEC. 23. Writs of *certiorari* may be granted by the Supreme Court of the United States for the review of cases arising under this act in the same manner as provided for patent cases by the act creating the Circuit Court of Appeals.

SEC. 24. That any person who, with intent to defraud, falsely makes, forges, reproduces, copies or counterfeits, or colorably imitates or causes or procures to be made, forged, reproduced, colorably imitated, copied or counterfeited any trademark duly registered under the provisions of this act, knowing the same to be a colorable imitation or counterfeit of such trade-mark, and who uses or causes the same to be used in commerce with foreign nations, or among the several states, or with the Indian tribes, or who affixes the same, or causes the same to be affixed, to merchandise of substantially the same descriptive properties as those referred to in said registration of such trade-mark, and who uses the same in commerce with foreign nations, or among the several states, or with the Indian tribes, or who otherwise passes upon the public or utters in commerce with foreign nations, or among the several states, or with the Indian tribes, any false, reproduced, copied, counterfeited or colorable imitation of such registered trade-mark, knowing the same to be falsely made, forged, reproduced, copied, counterfeited, or such colorable imitation, shall, upon conviction thereof, be punished by a fine of not more than five hundred dollars or by imprisonment at hard labor for not more than one year, or by both such

fine and imprisonment in the discretion of the court.

SEC. 25. That every person who, with intent to defraud, shall deal in, or sell, or cause or procure the sale of in commerce with foreign nations, or among the several states, or with the Indian tribes, any merchandise or article of substantially the same descriptive properties as those referred to in the registration of any trade-mark duly made under the provisions of this act, to which or to the package in which the same is put up is fraudulently affixed such trade-mark or any counterfeit, or colorable imitation thereof calculated to deceive the public, knowing the same to be counterfeit or not the genuine merchandise or article referred to in such registration, shall, on conviction thereof, be punished as prescribed in Section 24 of this act.

SEC. 26. That every person who, with intent to defraud, uses or affixes, or causes or procures to be fraudulently used or affixed, any trade-mark duly registered under the provisions of this act, or any colorable imitation thereof calculated to deceive the public, in, with or to any merchandise or article of substantially the same descriptive properties as those referred to in such registration, or to the package or enclosure in which the same is put up, knowing the said trade-mark to be counterfeit, or knowing the merchandise not to be genuine merchandise or article referred to in such registration, and who sells or uses the same, or causes the same to be sold or used in commerce with foreign nations, or among the several states, or with the Indian tribes, shall, on conviction thereof, be punished as prescribed in Section 24 of this act.

SEC. 27. That every person who, with intent to defraud, fills, or procures to be fraudulently filled, any package to which is affixed any trade-mark duly registered under the provisions of this act, or any colorable imitation thereof calculated to deceive the public, with any merchandise or article of substantially the same descriptive properties as those referred to in such registration, knowing the said trade-mark to be counterfeit, or knowing the merchandise not to be the genuine merchandise or article referred to in such registration, and sells, or uses, or offers for sale or use such counterfeit merchandise in commerce with foreign nations, or among the several states, or with the Indian tribes, shall on conviction thereof be punished as prescribed in Section 24 of this act.

SEC. 28. That any person who, with intent to injure or defraud the owner of any trade-mark duly registered under the provisions of this act, or any other person lawfully entitled to use or protect the same, shall, in commerce with a foreign nation, or among the several states, or with the Indian tribes, buy, sell, offer for sale, or deal in any used or empty box, envelope, wrapper, bottle, cask, case or other package to which is affixed, so that the same may be obliterated without substantial injury to said box or other thing aforesaid, any such registered trade-mark not so destroyed, defaced, erased or obliterated as to prevent its fraudulent use, shall, on conviction thereof, be punished as prescribed in Section 24 of this act.

SEC. 29. That any person who shall, with intent to defraud any person or persons, knowingly or willfully aid in or abet the commission of any of the offenses described in Sections 24, 25, 26, 27 and 28 of this act, shall, upon conviction thereof, be punished by a fine not exceeding two hundred and fifty dollars or by imprisonment for not more than six months, or by both such fine and imprisonment, in the discretion of the court.

SEC. 30. That no action or suit shall be maintained under the provision of this act in any case when the trade-mark is used in any unlawful business

or upon any article injurious in itself, or which mark has been used with the design of deceiving the public in the purchase of merchandise, or under any certificate of registration fraudulently obtained.

SEC. 31. That nothing in this act shall prevent, lessen, impeach or avoid any remedy at law or in equity which any party aggrieved by any wrongful use of any trade or other mark, commercial name or indication of locality of origin might have had if the provisions of this act had not been passed.

SEC. 32. That nothing contained in this act shall prevent the registration as a trade-mark of any word or words, letter, figure or combination of letters or figures used as a trade-mark in commerce among the several states, or in commerce with foreign nations, or with the Indian tribes before the third day of March, eighteen hundred and eighty-one, and which has distinguished the goods of the applicant or his predecessor in business.

SEC. 33. That no article of imported merchandise which shall copy or simulate the name of any domestic manufacture or manufacturer or trader, or of any manufacturer or trader located in any foreign country, which by treaty, convention or law affords similar privileges to citizens of the United States, or which shall copy or simulate a trade-mark registered in accordance with the provisions of this act, or shall bear a name or mark calculated to induce the public to believe that the article is manufactured in the United States, or that it is manufactured in any foreign country or locality other than the country in which it is in fact manufactured, shall be admitted to entry at any custom house of the United States. And in order to aid the officers of the customs in enforcing this prohibition any domestic manufacturer or trader and any foreign manufacturer or trader who is entitled under the provisions of a treaty, convention, declaration or agreement between the United States and any foreign country, to the advantages accorded by law to citizens of the United States in respect to trade or commercial marks, and commercial names, may require his name and residence, and name or mark of the locality in which his goods are manufactured, and a copy of the certificate of registration of his trade-mark issued in accordance with the provisions of this act, to be recorded in books which shall be kept for this purpose in the department of the Treasury under such regulations as the Secretary of the Treasury shall prescribe, and may furnish to the department facsimiles of his name, the name or mark of the locality in which his goods are manufactured, or of his registered trade-mark; and thereupon the Secretary of the Treasury shall cause one or more copies of the same to be transmitted to each collector or other proper officer of the customs.

SEC. 34. That for the purpose of this act the United States shall be held to include and embrace all territory which is under the jurisdiction and control of the United States; and the word "states," as used in this act, shall be held and construed to include and embrace the District of Columbia, the territories of the United States and such other territory as shall be under the jurisdiction and control of the United States.

SEC. 35. This act shall take effect upon its passage. All acts and parts of acts inconsistent with this act are hereby repealed, except so far as the same may apply to certificates of registration issued or applied for under the act of Congress approved March 3, 1881, entitled "An act to authorize the registration of trade-marks and protect the same," or under the act approved August 5, 1882, entitled "An act relating to the registration of trade-marks."



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE, which keeps inventors and manufacturers posted in the art in which they are mostly interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued August 25, 1903.

### MECHANICAL PATENTS.

Continued from September number.

Grate bar..... O. Schimansky  
Grease cup. Compression..... F. N. Gardner  
Greenhouse bench..... P. M. Pierson  
Greenhouse gutter and roof support.....  
..... W. O. Johnston et al  
Grinding and polishing machine.....  
..... W. L. Godfrey et al  
Grinding apparatus..... H. W. N. Cole  
Grinding curved work. Machine for.....  
..... C. L. Goehring et al  
Hammer. Power..... W. R. Jenkins  
Hanger..... L. Hill  
Harness..... O. A. Swart  
Harrow. Flexible..... N. H. Bloom  
Harvester attachment..... F. W. Seidl  
Harvesting machine..... J. F. Appleby  
Hat box..... W. M. Manning  
Hay rack..... J. J. Guidinger  
Hay rakes. Automatic trip for horse.....  
..... E. A. Johnston  
Headache or insomnia. Mechanism for relief  
of..... J. R. Porter  
Heeling machines. Cementing attachment for  
..... J. M. Irving  
Hinge..... J. H. Fry  
Hoisting and dumping apparatus..... C. Lamar  
Hoisting bucket. Two part..... A. E. Howes  
Hoppers. Gate operating mechanism for.....  
..... F. Bowers et al  
Hopple..... H. C. Williams  
Horse detach..... S. Riegel  
Horse holder..... J. Stanicek  
Hose coupling..... H. Crump et al  
Hydrocarbon burner..... F. A. Reynolds  
Hydrocarbon injector..... W. W. Tuck et al  
Ignition device. Electrical..... E. W. Brooks  
Insulated rail connection..... W. E. Clark  
Insulator..... W. G. Rutledge  
Internal combustion engine..... R. Diesel et al  
Invalid's table..... G. E. Dewey  
Jack-o'-lantern helmet..... J. J. Du Ket  
Key fastener..... R. L. Lumry  
Knuckle joint..... F. M. Daly  
Ladder. Hinged..... A. F. Conner  
Lamp..... R. M. Dixon  
Lamp. Acetylene..... E. Moreau  
Lamp. Candle..... T. C. Richards  
Lamp. Electric arc..... H. T. Harrison  
Lamp. Electric arc..... M. H. Baker  
Lamp. Electric arc..... T. L. Carbone  
Lamp. Formaldehyde reissue..... R. P. Kuhn  
Lamp. Incandescent..... L. Denayrouze  
Lamp. Incandescent electric..... J. W. Forster  
Lamp socket. Incandescent..... O. E. Kenney  
Lamp socket. Incandescent..... J. L. Yost et al  
Lamps. Automatic lighter or extinguisher for  
gas..... N. H. Shaw  
Lamps. Means for starting electrolytic or  
Nernst..... E. Oxley  
Lard, &c. Device for handling and measuring  
..... J. F. Needles  
Leather. Manufacture of artificial..... G. Gautier  
Lens grinding machine..... G. A. Bader  
Lift..... H. D. Barlow  
Lightning protector..... J. D. Timmerman  
Liquid delivery apparatus. Check controlled  
..... H. Feldmeier  
Loading machine attachment. Automatic.....  
..... T. M. Park  
Lock..... T. H. Rea  
Locomotives. Reel attachment for mine.....  
..... K. Rushton  
Loom..... B. F. McGuinness  
Loom. Beadwork..... E. J. Bush  
Loom picker stick check..... E. H. Gleason  
Loom shed forming mechanism.....  
..... 2 pats. C. F. Roper  
Loom shuttle changing mechanism.....  
..... A. E. A. & G. Walker  
Loom sweep strap..... C. P. Nichols  
Loom warp stop motion..... J. H. Wolger  
Lung and voice developer..... P. E. Nichol  
Mail conveyor..... E. Beghtel  
Mantles. Loop for incandescent. H. Anhaltzer  
Massage machine..... C. Pfanschmidt et al  
Match machine..... W. F. Hutchinson  
Measuring device..... A. M. Bates  
Measuring instrument. Electrical..... W. J. Lloyd  
Measuring instrument. Electrical..... T. W. Varley  
Measuring mechanism for warpers. H. Hebert  
Mechanical movement..... E. G. Johanson  
Mercerizing apparatus..... J. P. Ecob  
Metallurgical furnace..... S. Stewart et al  
Meter glass cleaning device..... J. C. Michie  
Miter box. Knockdown..... A. C. Birge  
Motor..... C. M. Kiler  
Mowers. Grass receptacle for lawn..... C. F. Hamlin  
Muffler..... L. P. Moores  
Music leaf turner..... E. C. Graefenhan  
Musical instrument..... F. Kindermann  
Necktie fastener..... C. W. & L. J. Gronde  
Necktie fastening device..... A. B. Merritt  
Nut lock..... D. J. Thorne  
Nut. Lock..... J. H. Rivers  
Nut wrench. Vehicle..... P. F. Rice  
Oil vapor or gas engine..... W. Brown  
Oils into a soluble oil. Converting solidified.....  
..... A. Kronstein  
Ore concentrator..... C. A. Bonner et al  
Ore jigger..... E. J. Muller  
Ores. Treating rebellious or refractory.....  
..... A. M. Beam  
Organ motor. Self playing..... C. Warren  
Packing. Valve stem..... C. F. McComas  
Paper hanger's size..... A. H. Thime  
Paper roll bushing..... M. L. Hirsch  
Pen or pencil grip..... C. W. T. Davies  
Pencils. Eraser tip for lead..... W. H. Brownell  
Piano action..... C. A. Ahlstrom

Piano players. Pneumatic motor valve mechanism for automatic..... T. Danquard  
Picture frame..... J. A. Manor  
Pigment and making same..... W. J. Armbruster  
Pigments. Making..... W. J. Armbruster  
Piles or the like. Protective covering for.....  
..... O. A. Stempel  
Pinion. Rawhide..... C. S. Grannis  
Pipe fastening device. Vent..... J. J. Meyer  
Pipe header. Water..... J. A. Carlson  
Pipe ventilator. Leader..... G. M. Vroome  
Plating machine..... D. L. Chandler  
Plane bit..... S. Jones  
Planter and fertilizer distributor. Combined  
seed..... J. H. Bedingfield  
Planter and fertilizer distributor. Cotton.....  
..... B. L. Robbiss  
Planter. Checkrow corn..... R. L. Parsons  
Planter. Potato..... F. Kohser  
Pliers. Dressmaker's marking..... L. Holt  
Plow..... J. B. Smith  
Plow. Garden..... S. Jones  
Plow. Safety..... W. T. M. Brunner  
Polishing apparatus. Fire..... D. W. Gundlach  
Post driver..... J. K. North et al  
Potato digger. Rotary..... W. Waters et al  
Precious metals. Recovering..... A. M. Beam  
Printing plate finishing machine..... F. C. Leethen  
Printing press tympan..... A. S. Allen  
Printing surface..... G. S. Christie  
Propeller. Auxiliary screw..... R. P. Gibbons  
Propeller. Screw..... E. Fox  
Propelling apparatus. Vessel..... L. Dion  
Propulsion. Marine..... H. H. Fowler  
Pulley..... C. H. Bicalky  
Pump..... G. C. Richards  
Pump..... C. F. Scott  
Pump. Air..... H. Harris  
Pump. Air..... J. B. Lyford et al  
Pump housing..... J. W. Webster  
Pump regulating mechanism..... W. C. Bucknam  
Pump rod coupling..... S. M. Abbot  
Pumping apparatus..... F. C. Caiu  
Puzzle..... J. H. Dieringer et al  
Puzzle or toy..... F. D. Brinton  
Racking and bunging apparatus. Counter  
pressure..... H. Reininger  
Radiator..... C. D. Sautorn et al  
Radiator for internal combustion motors, &c.  
Heat..... F. W. Darnstaedt  
Rail joint..... O. B. Starkey  
Rail joint..... H. J. Bubenheim  
Rail joint..... F. B. Byers  
Rail joint..... F. V. Lacy  
Rail joint..... W. P. Bowers  
Railway brake. Automatic..... L. Seile  
Railway frog foot guard..... H. Hooker  
Railway. Inclined..... S. E. Jackman  
Railway rail joint..... F. Veith et al  
Railway signal. Automatic..... E. Renaud  
Railway signal controlling system..... G. Gibbs  
Railway signal. Electric..... H. A. Ammann et al  
Railway switch..... L. Trebert  
Railway switch safety device..... E. Renaud  
Railway tie. Metallic..... C. A. Skibbe  
Receptacle closure..... J. H. Rivers  
Reciprocating piston engine..... F. W. Brady  
Reflecting panel..... F. L. O. Wadsworth  
Refrigerator..... C. L. Siebert  
Retinoscope..... H. L. De Zeng  
Riveting mechanism..... C. J. Carney et al  
Roasting furnace..... E. C. Brice  
Root puller..... A. E. Bunt  
Ropes. Apparatus for mechanically greasing  
..... M. Graf et al  
Rotary engine..... J. F. Muncey  
Rotatably mounted wheel..... W. M. Scott  
Sad iron..... W. W. Lind  
Safety pin..... L. Greer  
Saline solutions. Electrolytic decomposition  
of..... A. B. Larchar  
Sash fastener..... C. F. Stone  
Sash lock..... J. H. Clements  
Sash rod..... T. C. Richards  
Sash. Window..... G. W. Richardson  
Saw filing machine..... J. D. Smith  
Saw for resawing box lumber. Horizontal  
band..... A. Meeen  
Saw guide..... B. A. Brink  
Saw. Hand..... R. F. E. Okrassa  
Scaffold. Adjustable..... J. E. England  
Scale. Computing..... C. A. Deyerle  
Scarf pins, studs, &c. Safety device for.....  
..... M. Crohn  
Scholar's companion..... M. E. Dinsmore  
Scraps. Machine for compressing detinned.....  
..... M. Lemberg  
Scraps. Machine for compressing detinned or  
other..... M. Laerno et al  
Screw cutting device..... E. W. Bullard  
Screw driver..... W. S. Ward  
Seeder. Broadcast..... C. J. Rinderknecht  
Sewing machine needle guide mechanism.....  
..... J. L. Kieffer  
Sewing machine ripping attachment.....  
..... W. J. Cunningham  
Sewing machine take up..... J. Diehl  
Sewing machine thread cutting mechanism.....  
..... R. L. Lyons  
Sewing machine. Two needle hemstitch.....  
..... 2 pats. A. J. A. Oesterreich  
Ship building plate..... J. Chapman  
Shoe jack..... R. D. Tittle  
Shoe polisher..... J. V. Peacock  
Shoe shining machine..... J. C. C. Scheer  
Sign board. Reversible..... O. H. Peters et al  
Sign. Electric..... T. E. Murray  
Signaling. Apparatus for selective electric.....  
..... 2 pats. reissue. J. S. Stone  
Siphon filler..... J. K. Turajski  
Skirt fastening. Adjustable..... C. H. G. B. McWilliams  
Smelting furnace..... E. Riveroll  
Snap hook..... J. A. Gavitt  
Snatch block..... E. S. Grammer  
Sound reproducers. Stylus or needle for.....  
..... V. H. Emerson  
Spectacles. Shooting..... J. Ender  
Spike puller..... C. F. Tillberg  
Spinning frames. Automatic thread board  
lifter for..... N. N. S. Daudelin  
Spraying apparatus..... F. Ripley

Square clamping device. T..... G. H. H. Emmett  
Stair rod fastener..... T. C. Richards  
Stalk breaking and fiber cleaning machine.....  
..... S. B. Allison  
Stall. Cattle..... M. J. Drown  
Steam boiler..... A. W. La France  
Steam boiler..... A. W. La France  
Steam engine..... J. Stumpf  
Steam engine..... S. B. House  
Steam engine..... W. Sutcliffe  
Steam generator..... F. M. Ashley  
Steam generator..... C. F. Ruby  
Steam generator..... J. Schutte  
Steam generator..... J. S. Chenhalls  
Stoker. Automatic..... H. L. Wilson  
Stone. Composition for artificial.....  
..... L. Roehm et al  
Stone compound. Artificial..... J. S. Burns  
Stone molding machine. Artificial.....  
..... E. W. Stevens  
Stove grate..... J. V. Frederick  
Stove or range..... J. N. Young  
Strainer and mixer. Liquid..... W. F. O'Neill  
Surgical bandage..... G. F. Sumner  
Suspensers..... L. E. Schoch  
Suspension seat..... H. G. Grote  
Swing and chair. Combined..... C. W. Rote  
Swingletree..... P. Krall  
Switch operating and locking mechanism.....  
..... E. W. Coughlin  
Switch operating mechanism. Snap.....  
..... C. A. Clark  
Switch operating mechanism..... T. Fleming  
Tacks. Forming..... G. J. Capewell  
Tap borer..... E. G. Hayne  
Teaching and practice of telegraphy. Instrument  
for..... C. E. Chinnock  
Teaching music and singing. Device for.....  
..... A. Gusinde  
Telegraph. Automatic printing..... 2 pats.....  
..... C. L. Buckingham et al  
Telegraphy. Wireless..... C. G. Burke  
Telephone test instrument..... H. G. Chalkley  
Telephonic apparatus..... M. R. Hutchison  
Tempering apparatus..... A. M. Chase  
Tenoning machine..... W. J. McNaul  
Testing machine..... S. M. Taylor  
Thread board lifter. Automatic.....  
..... W. E. Sharples  
Threshing machine. Flax or hemp.....  
..... J. T. Smith  
Tickler. Office..... F. E. Smith  
Tin from scraps of tinned iron. Recovering.....  
..... B. A. Bergman  
Tire..... E. B. Cadwell  
Tire..... C. Miller  
Tire cleaner. Bicycle..... F. J. Smith  
Tire heating device..... C. Solberg  
Tobacco pipe..... P. H. Barz  
Top. Spinning..... C. Marx  
Toy car..... E. Sollmann et al  
Toy. Mechanical..... R. Cairns  
Trace hitch..... J. S. & N. R. Briel  
Track sanding device..... J. H. Haulon  
Traction engine..... F. S. Brown  
Trestle..... S. G. Mortimer  
Trolley pole base..... A. D. Crossley  
Trousers hanger and stretcher..... E. A. Burrell  
Truck for tramway cars, railway carriages,  
&c. Four wheeled..... A. S. Nelson et al  
Truck. Piano..... F. W. Shoecraft et al  
Truss. Hernial..... J. U. Adams  
Truss. Hernial..... J. N. Schiffer  
Tubs or sinks. Adjustable support for.....  
..... J. Crawford  
Tunnel construction..... D. Phillips  
Turbine. Elastic fluid..... T. G. E. Lindmark  
Typewriter..... E. Nowak  
Typewriting machine..... C. H. Shepard  
Typewriting machine..... R. D. Stackpole  
Vacuumizing and double seaming machine.....  
..... E. Norton  
Valve..... O. M. Jones  
Valve. Exhaust relief..... F. McCarthy  
Valve for air brakes. Triple..... D. M. Robinson  
Valve for boiler and pump connections.....  
..... F. A. Reynolds  
Valve gear. Steam engine..... J. W. Sargent et al  
Valve. Multiported balanced..... C. A. Daigh  
Valve. Pressure regulating..... C. L. Bastian  
Vehicle top..... A. W. Kavel  
Vehicle wheel..... N. A. Newton  
Vehicle. Means for supplying current to electric.....  
..... R. A. E. Huber  
Vending machine..... J. D. Kneidler  
Vending machine..... E. Shaw  
Vending machine. Coin controlled..... J. Gabel  
Vending machine. Coin freed.....  
..... J. W. Pearson  
Veterinary surgical instrument..... G. H. Summerfeldt  
Vote recording and voter's number registering  
machine..... J. T. Hood  
Voting machine..... G. Johnson  
Wagon brake..... C. H. Gunn  
Wagon jack..... E. Prescott  
Watch guard or protector..... W. C. Locherty  
Watch. Stem winding..... W. E. Porter  
Water current driven motor..... T. A. MacDonald  
Water heater..... J. Summerfield  
Wax pad..... C. C. Bonar  
Well casing spear..... R. I. Henderson  
Well drilling apparatus..... L. D. Shryock  
Well drilling apparatus..... C. S. Wright  
Well slitting machine..... H. Lyon  
Whip load..... A. J. Cook  
Winding machine cleaner..... W. H. Sheridan  
Window..... C. Vose  
Window cleaning device..... E. Maske  
Window lift..... C. E. Haring  
Window or door screen..... A. S. Winn  
Window screen..... J. W. Adams  
Windmills. Means for adjusting strokes of.....  
..... L. Williams  
Wire bending machine..... A. C. Campbell et al  
Wire cover..... H. C. Boyle et al  
Wire feeding mechanism..... A. C. Campbell  
Wire rod treating apparatus..... 2 pats.....  
..... F. H. Daniels  
Wrench..... C. E. Bonner  
Wrench..... W. H. Meiss  
Wrench..... O. J. Riedmiller  
Zinc and copper. Treating ores for recovery of

..... A. M. Beam  
Zinc box. Precipitating..... J. B. & W. L. Truitt et al

### DESIGNS.

Badge..... J. C. Irvine  
Knives or similar articles. Handle for paper  
..... 2 pats..... M. C. Day  
Photograph mount..... F. E. Housh  
Picture frame..... S. Balinski  
Pipe rack..... D. M. Wunschow  
Silverware or similar articles. Handle for.....  
..... H. Weber  
Silverware or similar articles. Spout for.....  
..... H. Weber  
Silverware or similar articles. Trimming for.....  
..... H. Weber  
Smoke ring maker..... E. Nahr  
Smokers' articles. Holder for.....  
..... D. M. Wunschow  
Spoons, forks, or similar articles. Handle for  
..... 2 pats..... E. Crees et al  
Spoons, forks, or similar articles. Handle for.....  
..... S. A. Keller  
Spoons or similar articles. Handle for.....  
..... J. E. Straker, Jr

Issued September 1, 1903.

### MECHANICAL PATENTS.

Abrading shoe..... J. M. Griffin  
Acid. Apparatus for manufacturing sulfuric.....  
..... J. B. F. Herreshoff  
Acid. Making sulfuric..... J. B. F. Herreshoff  
Aerial navigation. Machine for..... I. I. Morris  
Air and water heating apparatus..... C. H. Atkins  
Air or other similar brake. Compressed.....  
..... A. Chammont  
Amusement apparatus..... J. H. Maguire  
Artillery. Heavy field..... T. D. Smythe  
Automobile controlling mechanism..... H. F. Cuntz  
Awning..... A. L. Sabey  
Axle skein..... E. Lamb  
Bag fastener..... C. M. Du Frane  
Bag holder..... A. W. French  
Baling press..... L. G. Reynolds  
Ball bearing washer..... C. J. Caley  
Barrel press..... A. Schenck  
Batteries used in connection with dynamo electric  
machinery, &c. Mode of and apparatus  
for regulating the charge and discharge of  
storage..... R. S. McLeod  
Bed and sofa or chair. Convertible..... L. Kragen  
Bed brace..... J. W. E. Smith  
Bed spring tightening device..... J. W. Westlake  
Beds and removing them from same. Device  
for lifting sick people in..... A. Gaiser  
Bell alarm attachment. Electric.....  
..... H. Blakeney et al  
Belt for medical purposes. Electric..... E. Smellie  
Belt shifting device..... J. Weichhart  
Berth and divan. Convertible..... H. B. Arnold  
Bicycle mud guard..... H. Fesenfeld  
Bicycle saddle..... E. C. Moury  
Binder..... E. M. Anderson et al  
Blind wiring machine..... C. Hinz  
Boiler..... S. T. J. Bray  
Boiler..... M. F. Kenely  
Boiler circulator. Steam..... J. P. Urbanek  
Boiler furnace. Steam..... G. A. Fisher  
Boilers. Apparatus for controlling level of  
water in steam..... H. A. Fleuss  
Book. Compartment record..... C. D. Chichester  
Book cover..... B. E. Schrenk  
Boring and tenoning machine..... J. Wilson  
Bottle..... M. A. Lazareff  
Bottle..... J. P. Harrison  
Bottle and stopper..... C. Holloway  
Bottle or other vessel..... Z. F. Jones  
Bottles. Device for preventing refilling of.....  
..... F. W. Johnson  
Box counter..... H. G. Roth  
Box cover. Detachable..... H. G. Roth  
Box plate and attachment therefor..... H. McCann  
Brake rigging..... E. A. Curtis  
Brake shoe key..... A. L. Streeter  
Brick making machine..... W. A. Houts  
Bridge. Iron railway..... J. A. L. Waddell et al  
Brush..... H. M. Schwartz  
Buckle..... R. C. Pool  
Buckle. Cross line..... H. S. Englebright  
Buggy top support..... S. D. Fry  
Burial purposes. Metallic box for.....  
..... A. E. Lockhart  
Butter pat forming machine..... E. O. Sutton  
Cabinet..... A. D. Acers  
Cabinet or dark room. Collapsible..... L. T. Wilson  
Camera..... M. Schell  
Camera. Automatic photographic.....  
..... S. N. Navasquez  
Camera focusing device..... M. Schell  
Camera shutter. Automatic photographic.....  
..... S. N. Navasquez  
Camera. Stereoscopic..... H. M. Reichenbach  
Can body making machine..... A. P. Wolfe  
Can heading and double seaming machine.....  
..... G. J. Record  
Car brake. Emergency..... J. M. Hedrick  
Car bumper. Railway..... T. Collins  
Car coupling..... M. L. Gaskill  
Car coupling..... R. B. Stearns et al  
Car coupling..... A. H. Renshaw  
Car door fastener. Automatic..... L. B. Perrin  
Car draw head..... J. F. Courson  
Car fender..... W. J. Westgate et al  
Car. Metallic..... E. W. Summers  
Car safety mechanism. Motor..... C. J. Eckroad  
Car sign..... J. W. Bailey  
Car starter..... J. R. Trott et al  
Cars or the like. Life saving guard for tram.....  
..... W. T. G. Ellis  
Cars. Walking beam for hand..... P. J. Garrison  
Carburetor for carbureting lamps.....  
..... F. W. Warner  
Carpet beating machine..... F. Muhl  
Carpet fastener..... M. Schick  
Carpet sweeper and beater..... A. V. Fedor  
Chain. Drive..... C. W. Levalley



- Champagne fermented in bottles. Clearing and purifying..... K. Kiefer  
Chandelier. Gas distributing..... J. C. Jennings  
Change maker..... J. Pfeifer  
Channel laying machine..... M. T. Harrigan  
Charging machine..... D. H. Lentz  
Chatelaine clasp..... B. vom Eigen  
Checkrein holder..... J. V. Emmitt  
Chopping machine..... A. Schyia  
Christmas tree candle holder..... P. Rummelin  
Circuit controller..... E. J. McAllister  
Cistern..... J. Nelson  
Clasp..... J. Goldberg  
Clock. Pendulum..... J. W. Daily  
Clock. Self winding electric..... E. Schultz  
Cloth cutter..... J. T. Preston  
Cloth texturing machine. Stop motion..... J. L. Dabbs  
Clothes hanging device..... C. F. Cox  
Coating metal pipes or conduits. Apparatus for..... T. E. Dwyer  
Coating metal pipes or conduits. Apparatus for..... G. W. Harrington  
Cock. Ball..... A. Nelson  
Coffin frame..... M. L. Carpenter  
Coin slot..... J. Loch  
Collapsible table..... C. E. Wehn  
Color carriages. Mechanism for propelling..... A. Foruander  
Concrete building blocks. Machine for forming..... J. H. Stewart  
Converter..... W. B. Burrow  
Converter for making iron or steel..... W. B. Burrow  
Cooling apparatus..... M. Wulff  
Corset..... M. A. Osburn  
Crank arm connection..... J. S. Fritz  
Crate. Folding..... J. S. Hilyard  
Cuff holder..... A. A. Rodman  
Cuff holder..... E. T. Specht  
Culinary articles. Ventilating lid or cover for..... E. L. Bauer  
Curtain fixture..... W. C. Brown  
Curtain support. Sliding..... D. L. Crossley  
Cutting and trimming machine..... W. R. Miller  
Dehorner..... G. J. Grabowski  
Dental instrument..... H. B. Harrell  
Display cabinet..... H. A. Warren  
Display device..... J. C. P. Webber  
Distance or range finder..... E. Nicholson  
Dock. Floating..... G. E. Titcomb  
Door. Automatically operating..... J. H. Whitaker  
Door closer..... L. M. Albright  
Door. Sliding..... W. W. Schouler  
Drawer pull..... C. F. Mosman  
Drawers..... T. F. Trimble et al  
Drawing frames. Shipper lock for..... H. A. & O. L. Owen  
Drilling machine..... W. M. & C. M. Dending  
Dry cell battery..... E. R. Gill  
Dust pan attachment..... E. S. Wheeler  
Dye and making same. Violet red azo..... F. Schmidt  
Dye and making same. Yellow sulfur..... R. Gley  
Egg case..... M. E. Chamberlain  
Electric alarm. Time controlled..... A. L. Ronell  
Electric battery..... 2 pats..... H. Halsey  
Electric heater or rheostat..... C. Wirt  
Electric lighting system..... H. Leitner et al  
Electric lock..... W. H. Hollar  
Electric machines. Magnet core for dynamo..... W. B. Burrow  
Electrical devices. Screw attaching means for..... H. T. Paiste  
Electrolytic apparatus..... G. & G. W. Bell  
Electrolytic process..... A. Birchaun  
Electromagnet..... W. M. Davis  
Electromagnet..... J. Duncau  
Elevator electric alarm..... F. O. Kinnecom  
Embroidery frame..... P. H. Walt  
Engine..... 2 pats..... A. F. Hall  
Engine igniter. Gas..... P. P. G. Hall, Jr  
Engines. Cooling means for gas..... C. E. Hitchcock  
Engraver's tool..... E. C. Muller  
Evaporating apparatus..... W. C. Anderson  
Evaporator..... J. J. Coffey  
Exercising apparatus..... G. Yoerger  
Exhibitor. Card, picture, or sign..... J. B. Leatherbarrow  
Eyeglass clasp..... G. Lowres  
Eyeglasses..... W. E. Cawood  
Fabric..... A. M. Longee  
Fabric picking table..... E. Zenger  
Face shield. Sanitary..... E. Dempsey  
Fastener..... 2 pats..... M. D. Shipman  
Fastening device..... L. C. Pierson  
Fancet..... J. P. Pigrenet  
Feed mechanism..... W. P. Devine  
Feed trough..... G. A. Sprow  
Feed water regulator..... H. H. Westinghouse  
Feed water regulator..... R. H. White  
Felly. Vehicle wheel..... R. Kronenberg  
Fence post..... C. B. Lombard  
Fence tie. Wire..... S. S. Withington  
Fertilizer distributor..... M. E. Lawrence  
Filter..... W. H. Hodshon  
Filter..... J. Kostalek  
Fire extinguisher systems. Valve for dry pipe..... F. R. Noss  
Firearm. Automatic..... H. Fuberg  
Firearm sight..... G. H. Tansley  
Firearms. Adjustable head rest for..... J. Gant  
Fireproof building..... J. T. Simpson et al  
Fish cleaning machine..... J. Kellington  
Fish plate and rail fastener..... W. H. Logan  
Floor machine..... D. Adams  
Floor mat. Flexible flat metal..... A. S. Burnell  
Flower pot stand..... W. H. Chapman  
Folding chair..... C. M. Wagner  
Fruit cutter..... C. Harpold  
Fruit picker..... W. Penny  
Fruit sizer..... W. M. Black et al  
Fruit tray..... J. H. Gunby  
Furnace..... W. W. Weaver  
Furnace air feeding apparatus..... C. C. Macmillan et al  
Furnaces. Means for feeding fuel to..... R. W. Grove  
Furnaces. Means for stoking..... W. W. Weaver  
Galvanic battery. Reversible..... E. W. Jungner  
Gas burner cut off..... S. Haigh  
Gas burner cut off. Automatic..... J. Hentz, Jr  
Gas check and vent apparatus..... B. Byers  
Gas generator. Acetylene..... J. Kuljis  
Gas generator. Acetylene..... J. H. Ross  
Gas heater..... J. R. Tyson  
Gas producer..... J. S. & F. L. Daniels  
Gas. Purifying..... E. Burchell  
Gas regulating and saving apparatus..... H. H. Dikema  
Gas. Treating air for use in connection with the manufacture of..... J. A. Bower  
Gases. Centrifugal apparatus for purifying..... H. A. Humphrey  
Gasolene. Means for volatilizing..... F. E. & F. O. Stanley  
Gear. Changeable speed..... L. E. Krotz  
Gear. Reversing..... C. W. Weiss  
Gear. Variable speed..... J. J. H. Sturmeier  
Gears. Shaft connecting device for change..... A. M. Harrison  
Glass annealing oven. Plate..... J. W. Cruikshank  
Glass plate. Illuminating..... F. L. O. Wadsworth  
Glass shearing machine..... W. Stewart  
Glassware chute..... A. L. Bingham  
Golf ball..... C. E. Boutwood  
Grader. Road..... J. T. Hallett et al  
Grader. Road..... J. T. Hall  
Grain and seed separator..... J. K. White  
Grain conveyer..... J. Mabus et al  
Grain or other products. Apparatus for urifying..... W. T. McCray  
Grinding mill..... C. N. McLaughlin  
Grinding mill. Ball..... P. T. Lindhard  
Grinding machine..... G. Olsen  
Guitar. Pedal..... L. Farago et al  
Guncotton steaming apparatus..... J. Selwig  
Hammer. Automatic..... C. R. McKibben  
Harvester. Grain binding..... W. N. Whitely  
Harvester reel..... F. A. Johnston  
Harvester stubble cutter attachment. Corn..... W. A. McCollough  
Hat brims. Machine for paring curls of..... G. E. Hunter  
Hay loader or stacker..... H. Sorensen  
Hay press. Hand power..... J. E. France  
Hay rack..... N. H. Emery  
Hay rack. Convertible..... C. C. Runyon  
Hay rake..... W. A. Dodd  
Heel. Shoe..... G. F. Fischer  
Hinge..... E. C. Hoffman  
Hoist..... O. C. Duryea et al  
Hoisting mechanism..... T. H. Butler  
Hook..... A. Carpenter  
Hook and eye..... A. W. Herbert et al  
Horse holding device..... R. Winchel et al  
Horse tail fastener..... E. Felsberg  
Horseshoe..... E. H. Jackson  
Horseshoe..... T. F. Judge  
Horseshoe..... J. W. Collins  
Horseshoe. Soft tread..... C. H. Beardsley  
Hot air register..... S. Tuttle  
Hydrocarbon burner..... C. Cannon  
Hydrocarbon lighting system..... R. D. Cody  
Ice cream freezer..... C. E. Taylor  
Ice cutting machine table..... T. H. Butler  
Illuminating device. Threshold..... G. Hall  
Indicator..... E. L. Walker  
Indoxyl and indigo preparations. Making..... W. Hentschel  
Induction coil. Self..... G. A. Campbell  
Induction coil. Self..... G. A. Campbell et al  
Iron and cement constructions. Trussing arrangement for..... M. Dumas  
Journal bearing..... A. Raymond  
Junction box, conduit, and electric wiring mechanism..... F. J. Kavlin  
Klin..... J. Brownlow  
Knob shank. Ball bearing..... C. J. Caley  
Ladder and trestle. Extension step..... C. Latta  
Ladder. Folding..... J. McMillan et al  
Lamp chimney holder..... E. Holmes  
Lamp. Electric arc..... A. Schweitzer  
Lamp. Electric arc..... T. L. Carbone  
Lamp. Electric incandescent..... W. B. Burrow  
Lamp hanger..... D. McEachern  
Lamps icket. Incandescent..... J. L. Yost et al  
Lamp socket. Incandescent..... W. A. Church  
Last..... C. N. Pre  
Lasting machine..... H. H. Cummings  
Lasting machine. Boot or shoe..... R. W. Peer  
Latch..... H. W. Bowman  
Lathe..... D. B. Bullard  
Lifting jack..... W. H. Oliver  
Lifting jack..... B. L. Adair  
Liquid and pulverized fuel burner..... W. W. Weaver  
Liquid filling apparatus..... R. C. White  
Liquid fuel burner..... H. A. Frautz  
Lithographic plates. Electrolytically preparing..... O. C. Strecker  
Load retaining stakes. Position governing means for..... D. Donaghy  
Locomotive blast pipe..... H. S. Wainwright  
Loom..... C. A. Herald  
Loom for cross weaving..... I. E. Palmer  
Loom let off and take up mechanism..... W. T. Kintzing  
Loom pile wire retainer..... H. Hardwick  
Loom shuttle motion..... W. F. Kintzing  
Lubricator..... J. P. Lewis  
Mail distributing system..... P. Reich  
Manhole cover..... J. J. Irvine  
Marker. Land..... T. M. Hendrickson  
Match box..... I. M. Manich  
Match safe. Single delivery..... W. A. Harmon  
Match. Safety..... J. E. State  
Mattress, cushion, &c..... C. A. Fisher  
Mattresses and making same. Pine needle stuffing for..... M. R. Cords  
Medallion or button making machine..... A. Phelps  
Medicine applicator..... J. N. Dews  
Metal expanding machine..... 2 pats..... G. J. Holl  
Metals. Indicator for locating sunken..... C. F. Pike  
Metronome..... J. Brady  
Milk pails. Knee rest for..... N. Hucksins  
Milking apparatus..... D. T. Sharples  
Minerals. Reducing..... O. B. Dawson  
Molding and pressing into shape moldable material. Apparatus for..... A. T. Haskell  
Molding. Electric conductor..... S. M. Burk  
Molding hollow articles. Apparatus for..... J. G. Morrison  
Mop..... W. G. Browne  
Mowing machine..... O. Elison  
Mowing machine..... A. T. Haynes  
Musical instrument. Stringed..... T. N. Audet Jr  
Nut lock..... N. D. Asdell  
Nut lock..... F. L. Decker  
Nut lock..... B. B. Moss  
Nut lock..... F. Parsons  
Nut lock..... A. R. Mulvane  
Nut press..... T. Ferry  
Oar or scull..... H. B. Murdoch  
Office door indicator..... J. D. Nifong  
Oil burner..... A. F. Murphy  
Oil burner..... G. W. Swartz  
Optical instrument..... E. L. Hubbard  
Ore bins. Delivery mechanism for..... W. Seaver  
Ore reducing and concentrating apparatus..... O. B. Dawson  
Outlet boxes. Supplemental base for..... G. L. Martin  
Packing. Gland for piston rod..... J. H. Lewis et al  
Packing implement..... J. Schlosser  
Packing. Metallic..... E. W. Tucker  
Packing. Rod..... T. Kinkade  
Paper box machine..... W. C. Baxter  
Paper box machine..... L. D. Lewis  
Paper boxes. Making..... J. Alger  
Paper drying apparatus..... W. M. Barber  
Paper paraffining machine..... R. J. Carrier  
Peat. Block of..... F. White  
Peat into blocks for fuel. Forming..... F. White  
Peat into blocks of peat. Apparatus for compressing and drying..... F. White  
Pens. Collapsible tube for fountain..... W. Bolles  
Petroleum burner..... A. Moorefield  
Photographic copying apparatus..... O. Fair  
Photographic print washer..... H. C. White et al  
Piano action..... A. A. Barthelme  
Piano actions. Bridge for..... J. F. Ramsey  
Piles. Apparatus for removing material from..... J. M. Dodge  
Pipe turning apparatus..... S. G. Elton  
Pipe wrench..... G. W. Johnson  
Plaiting attachment for tufting boards..... A. Freschl  
Planer. Hair..... N. J. Robedeau  
Planter and fertilizer distributor. Combined seed..... 2 pats..... J. H. McDaniei  
Planter. Check row corn..... T. M. Hendrickson  
Planter. Corn..... O. P. Tyson  
Planter. Cotton..... F. W. Key  
Playing ball..... 2 pats..... F. H. Richards  
Plov attachment..... F. Gale  
Pneumatic carrier system..... W. G. Davis  
Polishing machine..... H. L. Haskell  
Post canceling machine..... J. K. Toles  
Power device..... D. Lubin  
Power transmitter..... 2 pats..... E. T. McKaig  
Power transmitting mechanism..... P. W. Bettinger  
Printing attachment for roll paper holders..... R. E. Brunacci  
Printing or coloring floor coverings, &c., and articles thus produced..... A. F. Lundberg  
Printing press..... J. Durand  
Pump. Deep well..... N. A. Heyman  
Pump. Rotary force..... H. P. Curtis  
Pump valve..... R. Whitaker  
Pump valve arrangement..... P. F. Oddie  
Pumps. Shaft shield for centrifugal..... J. Hedlund  
Punch or blow testing machine..... G. W. Powell  
Puzzle..... D. C. Fulton et al  
Puzzle. Sliding block..... J. Bigham  
Pyrographic burners. Manufacture of..... W. D. Donovan  
Racking apparatus..... D. Beebe  
Radial drill..... O. W. Mueller  
Rail joint..... J. Nelson  
Rail joint..... B. J. Funsch  
Railway. Amusement..... A. E. W. Frazer  
Railway bond..... H. M. Bellows  
Railway brake..... D. W. Davis  
Railway contact device. Electric..... F. Kellogg  
Railway crossing..... W. F. Mills  
Railway rail joint..... S. Conkle  
Railway siding buffer..... T. L. McKeen  
Railway signal..... J. B. Reagan  
Railway third rail. Electric..... L. G. Johnstone  
Railway tie..... G. A. Gath et al  
Railway wagon. Single rail..... A. Lehmann  
Range..... R. L. Seeds  
Range finder. Depression..... A. Swasey  
Refrigerating apparatus..... W. W. Harris  
Resaw and bevel sliding machine. Combined..... C. Finnegan  
Rheostat..... E. Weston  
Rocking horse. Traveling..... R. Barrett  
Roll heating and cooling apparatus..... C. W. Bray  
Ropeway. Aerial..... J. P. Roe  
Rossing machine..... J. Moreau  
Rotary drier..... D. Grupe  
Rotary engine..... P. R. Matlocks et al  
Rotary engine..... H. E. Smallbone  
Rotary steam engine..... C. W. Edwards  
Sad iron handle..... F. Stuart  
Safe..... M. M. Long  
Salt cellar..... E. B. Little  
Sash balance..... H. E. Rathbun et al  
Saw. Drag..... S. Tuitt  
Sawmill set works..... R. F. Barker  
Scaffold. Butchering..... G. M. Launders  
Scale. Weighing..... J. Collins  
Screw driver..... W. M. Benzinger et al  
Screw machine..... F. L. Todd  
Sealing machine. Envelop..... E. D. Votav  
Seaming machine. Double..... O. S. Beyer  
Seeder and fertilizer distributor..... W. A. Davis  
Selective system..... 2 pats..... S. A. Reed  
Sewing machine cabinet..... W. Person  
Sewing machine. Wax thread..... W. J. Dobson  
Sewing machines. Presser foot mechanism for shoe..... M. T. Deune  
Shade holder. Electric..... F. McIntyre  
Shaft support and rein holder. Combined..... J. D. McCabe et al  
Shafts. Device for regulating the motion of rotary..... G. S. Herrick et al  
Sheet metal can..... I. E. Sexton  
Shell..... L. G. Roach  
Shirt waist holder and skirt supporter..... E. G. Brown  
Shoe. Ankle supporting..... A. Posner  
Shoe. Sporting..... D. J. Golden  
Shoemaker's ironing device..... A. S. Hayden et al  
Shovel attachment..... E. B. O'Connor  
Shuttle and shuttle eye..... P. P. Dandelin  
Sitter. Ash..... W. H. Boyle  
Skirt supporter..... L. H. Flory  
Snap hook..... G. H. Steele  
Socket wrench..... C. E. Crattlof  
Soda and barium sulfate. Producing caustic..... C. B. Jacobs  
Sole for shoes. Detachable..... J. P. Steele  
Spanner wrench. Adjustable..... T. C. Dufresne  
Spark arrester..... 6 pats..... H. S. Wainwright  
Speed regulator..... W. C. Runge  
Spinning frames. Shipper lock for..... H. A. & O. L. Owen  
Springs. End clip or bearing plate for semi-elliptic..... J. H. Evans  
Stacker. Hay..... W. H. Robbins  
Stanchion. Cattle..... J. H. M. Thompson  
Steam generator..... H. J. Fisher  
Steam generator..... R. Schulz  
Steam generator..... E. J. Wood  
Still..... W. Maybury  
Stitching and trimming machine. Blind..... C. McNeil et al  
Stools, chairs, or the like. Brace for..... L. N. Prentice  
Stop box lock..... L. R. Schunck  
Stove. Heating..... W. L. Rose  
Stove. Oil..... E. A. Anderson  
Stove or range. Cooking..... R. H. Babbitt, Jr  
Stovepipe fastener..... R. H. Hodge  
Stoves or ranges. Tea shelf for cooking..... W. A. Spicer  
Strainer. Feed pipe..... S. M. Vauclair et al  
Straining device. Automatic..... M. I. Lowry  
Stump puller..... F. M. Hawkins  
Suspender trimming..... E. R. Spencer  
Suspending device..... C. M. Pitel  
Switch operating mechanism..... A. A. Tripold  
Syringe pipe..... V. C. Vau't Wood  
Table leg fastening..... J. H. Robbins  
Tablet and copy holder. Combined writing..... J. E. Loveless et al  
Tag. Shipping..... J. C. Kimsey  
Talking machine sound box..... E. D. Gleason  
Tap blanks. Making..... F. N. Gardner  
Telephone drop switch..... G. L. Gulliford  
Telephone exchange system..... 2 pats..... W. M. Davis  
Telephone receiver support..... E. Bass  
Telephone system. Anti-induction..... 2 pats..... W. Condon et al  
Telescope..... G. N. Saegmuller  
Thermometer and making same. Shielded clinical..... S. C. Hirschberg  
Thill support..... U. C. Oblosser  
Thresher. Traveling..... M. Ereckson  
Threshing machine..... H. Bethuy  
Tie plate and rail brace..... J. A. Cystrom  
Tile, &c. Glass facing..... E. F. Chance  
Tile making machine..... 2 pats..... W. A. Houts  
Tiles. Appliance for forming designs with..... W. P. Meeker  
Tire..... E. B. Cadwell  
Tire for vehicles. Elastic..... W. Ballasa  
Tire. Vehicle..... A. Prinzhorn  
Tool. Combination..... A. A. Waymire  
Torpedo. Railway..... E. S. Lafferty  
Toy..... S. E. Miller  
Toy..... L. A. Allard  
Transom lifter..... T. A. Reidy  
Tripod head..... A. Marceau  
Trolley..... M. Nicholls et al  
Trolley wheel. Resilient multiple contact..... E. S. Cobb  
Trousers hanger..... S. W. Bonsall  
Towel handle. Detachable..... F. H. Ferand  
Truck. Brick..... G. Barrail  
Truck. Traction..... H. H. Schenk  
Trucks. Constructing or forming car..... R. C. Wright et al  
Trunk rest..... J. Willy  
Tubes or rods. Machine for profiling non-circular..... J. Reimann  
Tubing locking mechanism. Telescoping..... P. A. Bowen  
Tumbler grinding machine..... W. F. Altenbaugh  
Turbine actuated by steam..... J. W. Graydon  
Turpentine. Apparatus for the manufacture of..... C. W. Bilfinger et al  
Twine holder..... C. L. Peterson et al  
Typewriter actions. Support for links of..... O. C. Kavle  
Type writing machine..... C. H. Shepard  
Type writing machine billing platen..... J. A. Smith  
Type writing machine card or sheet holder..... 2 pats..... H. J. Halle  
Type writing machine card or sheet platen..... H. F. Eckert  
Umbrella..... J. H. Shepherd  
Vaccine and preparing same..... L. R. Parsons  
Valve..... J. B. Waring  
Valve for water heaters..... L. A. Krah  
Valve. Hopper closet..... R. N. Gill  
Valve. Locomotive..... C. E. H. Lincoln  
Valve mechanism. Engine..... H. J. Wessinger  
Valve mechanism for hydraulic motors..... E. H. Weatherhead  
Valve or cut off for tanks..... P. J. Leithausen  
Valve. Reducing..... J. B. Waring  
Valve. Throttle..... J. S. Chambers  
Vapor generator..... C. F. Hitchcock  
Vehicle..... E. Lohsard  
Vehicle body..... A. O. Very  
Vehicle driving mechanism..... P. Synnestvedt  
Vehicle life guard or obstruction remover..... A. Hudson et al  
Vehicle seat..... R. L. Fetters  
Vehicle top support..... T. R. Campbell  
Vehicles. Equalizing brace for spring..... P. Hebert  
Vending machine..... G. Rupley  
Vessels or the like from one water level to another in waterways. Conveying..... F. Schnapp  
Vest and shirt. Combined..... J. D. Van Fleet  
Vest. Lady's..... M. E. Langham  
Vise. Foot..... E. E. Newnam  
Washboiler..... A. McLeod  
Washboiler..... J. C. Bliemeister  
Washing machine..... T. Y. Hughlett  
Water closet attachment..... P. H. Bacon  
Water closet flushing apparatus..... J. A. Vogel  
Water heater..... L. M. Rehnquist  
Water heater..... G. J. Sebald et al  
Water regulator..... R. H. White  
Weevil. Apparatus for extermination of boll..... J. T. Taylor  
Well cap..... W. F. Shutt  
Well casing head. Oil..... J. Cochran  
Wheel and crank fastening..... J. V. Pugh  
Wheel nave. Metal..... E. P. Dignan  
Wheel or gear tooth. Sprocket..... J. M. Dodge  
Whiffletree hook..... W. D. Sutton  
Wigs. Manufacturing..... W. Schubert  
Windmill..... H. B. Smith  
Window cleaning chair..... J. H. Hanavan  
Window screen..... G. H. Henkel  
Windows. Means for keeping frost from..... J. S. Henderson et al  
Wire fastener..... J. Dickson  
Wire stretcher..... W. F. Jennings  
Wire working tool..... J. H. Major  
Wrench..... A. P. Milder  
Wrench..... W. A. Cumble  
Wrench..... G. W. Sprague  
Yarn. Manufacturing cotton..... H. W. Kearns
- DESIGNS.
- Lamp body. Gas..... 2 pats..... L. B. London  
Stove. Gas..... J. F. & F. O. Adams  
Vehicle body..... W. Dieter



Issued September 8, 1903.

## MECHANICAL PATENTS.

- Advertising device..... L. R. Gaynor  
Agricultural implement..... J. H. Auble  
Air brake..... A. J. De la Croix  
Air compressor. Hydraulic..... J. H. Shedd  
Air duct..... A. C. McCord  
Aluminium by hydrocarbons. Reducing.  
A. Reuterdahl  
Amusement device..... F. S. Terry et al  
Anchorage for dams or other structures.....  
J. F. Jackson  
Asparagus holder..... A. H. Brinkman  
Auriphone..... L. M. Atkinson  
Automobile controlling mechanism G. H. Day  
Basket..... F. Kretschmar  
Baskets. Hoop for veneer..... E. E. Leary  
Batteries and product thereof. Producing active material and electrodes for storage.....  
2 pats. O. P. Fritchle  
Batteries. Apparatus for producing active material and electrodes for storage O. P. Fritchle  
Bean picking machines. Separating roll for.....  
E. E. Wemp  
Bed bottom. Spring..... G. B. Smith  
Bed. Couch..... F. M. Tinkham  
Bed spring tension attachment G. E. Distelhurst  
Beds. Sheet for..... D. Grattan  
Bedstead..... C. Thompson  
Belt. Driving..... G. S. Ingle  
Bicycle bearing..... H. B. Gillette  
Bicycle. Motor..... J. W. Meijer  
Bicycle track..... R. H. Erwin  
Bluing. Effervescent laundry..... W. C. Pope  
Boat..... G. H. Rood  
Boats propelled by electric or other power. Means for guiding..... H. Healy  
Boats. Winch for fish..... J. J. McDonald  
Body brace..... W. B. Dewees  
Boiler alarm..... W. C. Heitkamp  
Boiler fitting. Hot water..... J. J. Lawler  
Boiler header. Steam..... E. J. Moore  
Book carrier and scholar's companion. Combined..... R. Lincoln  
Book for streets, railways, rivers, or the like. Guide..... C. Loewe  
Book. Index..... J. A. Best  
Book mark..... J. L. Thompson  
Boring mark..... E. Hipolito  
Bottle capping machine..... J. W. Madison  
Bottle closure..... G. Morris  
Bottle closure..... H. Hatch et al  
Bottle filling machines. Filling tube for.....  
S. C. Miller  
Bottle. Non-refillable..... W. E. Johnson  
Bottle or the like closure..... C. B. Overbaugh  
Bottles. Means for preventing refilling J. Reid  
Bowling alley. Loop the loop L. W. Maddaus  
Box corner cutting machine..... G. E. Priest  
Box fastener..... E. Samuel  
Box shooks. Machine for making F. C. Irvine  
Braising machine spindle..... L. W. Whitehead  
Bread and kneading board..... L. C. Hartsock  
Breaker bar..... M. F. Williams  
Brick machine..... W. C. Burghum  
Bridges. Automatic derailer for draw.....  
J. P. Cowing  
Brooder. Chicken..... C. Mittelstadt  
Brush for bran dusters, bolters, scalpers, grain-scourers, and separators..... G. R. Davidson  
Brush. Fountain blacking..... E. R. King  
Brush. Tuft cleaning..... W. T. Rolph et al  
Buckle. Harness..... M. E. Zeller  
Buffer..... F. Bruning  
Buggy top adjuster..... A. F. Swasic  
Building block..... B. F. Van Camp  
Building blocks or the like. Flask for molding..... E. G. Durant  
Burglar trap..... J. M. Tyler  
Burner..... J. T. Burr  
Bust developer..... S. P. Madeira et al  
Button attaching machine..... A. Hall  
Can heater attachment..... R. D. Townsend  
Candlestick. Miners..... R. P. Rasmussen  
Cane. Magazine torpedo..... D. D. Weisell  
Car brake..... A. R. Moore  
Car brake. Combined rail and wheel W. M. Deal  
Car. Combination..... C. V. Keegan  
Car coupling..... H. Kelley  
Car coupling..... S. C. Mason  
Car coupling..... C. A. Tower  
Car ends. Safety platform for..... P. Campbell  
Car fender..... J. A. Williams et al  
Car. Protected..... E. C. Mangelsdorf  
Car. Railway tank..... 3 pats. J. W. Van Dyke  
Car replacer..... W. Schott et al  
Car sign. Street..... J. J. Gill  
Car sign. Street..... C. L. Penfield  
Carbureting apparatus..... A. Carissimo et al  
Carpet beater..... W. A. McDaniel  
Carpet stretcher and tacker..... E. S. Bragg  
Carriage shifting rail..... J. P. Smith  
Cash register..... R. W. Hudson  
Cask. Hermetic gaseous liquid compress.....  
W. B. Dolsen  
Casket receptacle. Artificial stone or concrete.....  
L. L. Parry  
Casting machine..... E. Strauch  
Cement. Manufacture of 2 pats. W. A. O. Wuth  
Centrifugal way. Aerial..... C. L. Hagen  
Chains. Detachable connection for J. Solberg  
Channeling tool..... A. D. Puerner  
Child's block..... C. L. Pruyn et al  
Cigar bunching machine..... J. E. Smith  
Cigar punch..... L. J. Hopkins  
Clinometer..... F. T. Cable  
Clock. Illuminated..... W. T. Bell  
Cloth cutting gage..... N. A. Morse  
Clover huller..... L. S. Whiting  
Coal scuttle bottom..... H. E. Detmers  
Coat holder..... J. L. Seitz  
Cock or valve. Ball..... J. H. Cable  
Column. Metal..... J. F. Clutter  
Concentrator table..... R. T. Schraubstadter  
Concrete. Structure of strengthened.....  
W. E. Williams  
Cooking boiler..... L. J. Renoy  
Cord tip..... W. Kailing  
Corn husker corn separating device.....  
W. Gutenkunst  
Corn husking and shredding machine.....  
A. Rosenthal  
Cotton chopper..... J. A. Carlton et al  
Cotton gin attachment..... J. C. W. Stanley  
Coupling..... W. McConay, Jr  
Crate..... W. M. Woodworth  
Cross for church towers..... J. A. Blenke  
Cultivator..... J. A. Weaver  
Cultivator. Cotton and cane..... J. A. Dodd  
Curbing plate fastener..... I. L. Landis  
Curtain pole..... F. M. Michael et al  
Curtain support..... M. E. Brown  
Cuspidor. Sanitary..... M. E. Headland  
Cutting mechanism..... J. West  
Debranning apparatus..... S. S. Foote et al  
Dentist's tool for crimping edges of metal crowns..... E. Betts  
Deposit box. Safety..... E. A. Strauss  
Dishing and flanging machine..... C. Gabriel  
Display frame..... J. T. Henshaw  
Display stand..... J. L. Moore  
Distance instrument..... G. N. Saegmuller  
Distilling apparatus. Wood..... C. W. Bilfinger  
Ditching machine..... P. Berglund  
Doll, puppet, or the like..... F. Reinhardt  
Door closing device. Thermal F. M. Edmonds  
Dough dividing machine..... P. Mieleke  
Downdraft kiln. Double..... F. W. Dennis  
Draft equalizer..... J. B. Yeagley  
Draw gear and buffing apparatus..... J. H. McCormick  
Drawing press..... 2 pats. F. M. Leavitt  
Drill press..... S. C. Schauer  
Drilling engine..... J. B. Damas  
Drilling machine..... B. F. Mohr  
Drum. Heating..... J. J. Gunther et al  
Drum. Heating..... E. V. Coulston  
Dumping and elevating apparatus P. J. Manger  
Dye and making same. Anthracene M. H. Isler  
Dye. Red..... O. Nastvogel  
Eccentric or cam..... R. A. Stubbs  
Electric currents. Apparatus for changing character of..... N. S. Harter  
Electric machine brush..... C. R. Phillips  
Electric motor control. Apparatus for remote.....  
W. V. Ash  
Electric heater or radiator..... E. G. Rivers  
Electric traction. Prevention leakage of current to studs in surface-contact systems of.....  
B. H. Bedell  
Electrical tools. Automatic switch handle for.....  
J. I. Ayer  
Elevator door operating mechanism..... F. K. Fassett  
Engine exhaust muffler..... F. T. Cable  
Engines. Belt tightener for traction H. C. Clay  
Engines. Variable cut off for steam..... W. H. Bates et al  
Engraving machine..... I. R. Beam  
Envelop machines. Back folder for.....  
G. T. Lemelin  
Envelops. Making..... J. West  
Evaporator for hot air registers..... M. V. Hayes  
Explosive engine..... J. D. Lyon  
Extension table..... C. E. Smith  
Fabric coating machine..... J. N. Myers  
Faucet. Measuring..... A. J. Stephan  
Feed apparatus for steam boilers..... E. Schoof  
Feed cutter..... J. V. Frederick  
Feed water regulator, indicator, and alarm. Combined..... F. W. Collins et al  
Fence machine. Wire..... W. S. Pugsley  
Fertilizer distributor..... R. G. Cartin  
Filter..... L. E. Rogers  
Filter..... J. P. Rummel  
Finishing..... A. E. Berry  
Fire escape..... M. Cody  
Fire hose. Means for bridging over.....  
W. L. Doughty  
Fire truck and fire escape..... C. A. Barnes  
Fireproof floor construction..... P. T. Shields  
Fireproofing for books..... C. D. Levey  
Flax straw. Treating..... G. H. Ellis  
Flax treating machine..... G. H. Ellis  
Floor box..... H. Krantz  
Fluid receptacles. Delivery attachment for.....  
E. Hey  
Flushing apparatus. Closet..... G. Hoffman  
Food. Apparatus for producing and preparing certain articles of..... L. Romero et al  
Fuel burner..... E. F. Gwynn  
Furnace..... C. McMillan  
Furnace..... D. M. Reed  
Furniture, &c. Brace for..... J. H. Pace  
Galvanic cell..... 2 pats. L. Fiedler  
Game..... A. J. Brannham  
Game apparatus..... E. F. Wilson  
Game apparatus..... D. McRuer  
Game apparatus. Base ball..... I. J. Jacob  
Garment hanger..... A. H. Holland  
Garment supporter..... B. F. Orewiler  
Garment supporting girdle..... L. Fagan  
Gas burner..... J. L. Graham  
Gas burner..... E. F. Gwynn  
Gas burner. Incandescent..... A. Bachner  
Gas burner lighting attachment..... A. G. Chubb  
Gas burner. Safety..... E. A. d'Aquila et al  
Gas check. Adjustable..... J. F. W. Jost  
Gas extinguisher. Automatic..... V. A. Strom  
Gas generator..... W. C. Dillon  
Gas generator. Acetylene..... J. T. D. Heaton  
Gas generator. Acetylene..... W. A. Gribble  
Gas generator. Acetylene..... G. E. Chandler  
Gas generator. Acetylene..... C. Goodyear  
Gas generator. Acetylene..... N. Goodyear  
Gas generator. Acetylene..... C. W. Beck  
Gas. Manufacturing..... H. S. Elworthy  
Gas or vapor generator and motor. Combined.....  
O. F. Good  
Glass shaping apparatus..... W. Buttler  
Glove or garment fasteners. Stud member of.....  
J. V. Washburne  
Glue and gelatin. Making..... H. Weiss  
Gold saving device..... P. H. Carlyon  
Governor..... H. C. Sergeant  
Governor. Engine..... J. E. Wheelock  
Governor. Engine..... C. F. Knothe  
Governor for fluid compressors. Automatic.....  
N. A. Christensen  
Grain separator..... R. S. Rinker  
Gun. Field..... E. K. Reothne  
Gun. Magazine..... C. F. Outlaw  
Gun. Quick firing..... A. T. Dawson et al  
Hair drier..... H. V. Halliwell  
Hair pin. Safety..... reissue. A. H. Mosher  
Harrow..... G. D. Schlosser  
Harrow..... J. F. Fulkerson  
Harrow..... J. B. Kittinger  
Harvester. Grass..... H. H. & N. O. Michaelson  
Hay carrier..... W. Louden  
Hay rake..... L. S. Bortree  
Hay tedder..... L. S. Bortree  
Heat retaining pad..... J. Rich  
Heating system..... O. W. Mapes  
Heel and sole protector. Shoe..... R. A. Regester  
Heel breasting machine..... B. B. Waterman  
Hide stretching implement..... R. J. Barton  
Hinge making machine..... L. T. Weiss  
Hoisting apparatus..... C. E. Stevenson et al  
Hoisting machine brake. Automatic.....  
S. L. Lovell et al  
Holdback. Vehicle..... H. Breiding  
Hook and eye..... S. A. Bromberg  
Horn. Reed..... S. Goldberg  
Horseshoe..... T. Agnew et al  
Horseshoe calk..... M. R. Jackson  
Horseshoe. Cushion tread..... A. A. Spadone  
Horse supporter..... R. Gorton  
Hose supporter..... H. E. Crandall  
Hot water bottle..... F. H. Jones  
Husking machine..... G. R. Sherwood  
Hydrocarbon burner..... C. H. George  
Hydrocarbon burner..... I. P. Wilson  
Igniting device. Electric..... H. B. McNulty  
Incandescent burner..... W. Parfrey  
Incubator..... F. C. Keck  
Inking pad..... J. B. Loughton  
Insect destroying machine..... C. V. Dyer et al  
Insect trap..... H. L. Goodwin  
Insulator for handled vessels. Heat C. E. Allen  
Insole and arch support. Combined B. Nathan  
Irrigating apparatus..... D. Astle  
Irrigating device..... C. I. Wilson  
Jewelry. Initial attachment for.....  
N. Roitman et al  
Justifying mechanism..... F. B. Converse, Jr  
Kneading and mixing machine..... C. Cristadoro  
Lamp..... W. F. London  
Lamp. Acetylene..... J. A. Kruseman  
Lamp. Electric arc..... C. E. Foster  
Lamp. Horizontal gas or vapor electric.....  
P. C. Hewitt  
Lamp socket..... W. A. Socket  
Lamp socket..... L. Erikson  
Lamp socket. Incandescent..... J. L. Yost et al  
Lamp. Table..... A. Kitson  
Lantern globes. Manufacture of.....  
A. B. Houghton  
Lard compound..... J. B. Schienert  
Lathe attachment..... O. A. Gooch  
Lathe tool turret..... O. L. Brainard  
Leather joint. Peg strip..... B. O. Beland  
Life raft for ships. Detachable..... B. W. Booker  
Light projector. Colored..... S. P. Van Nort  
Lifter attachment..... F. M. Simonds et al  
Lock..... W. E. Bell et al  
Lock..... H. P. Townsend  
Locomotive controlling device. Automatic.....  
C. Hansel  
Locomotive engineer's alarm..... E. McClintock  
Locomotive smoke box..... J. E. Cooke  
Log turner. Sawmill..... F. T. Wilkes  
Loom shuttle checking mechanism J. E. Tichon  
Loom shuttle detecting means..... I. Snow  
Loom take up mechanism..... O. A. Sawyer  
Loom web replenishing mechanism.....  
A. E. A. & G. Walker  
Mail bag closure..... H. J. Heilig  
Mail bag fastener..... H. J. Heilig  
Mail bag fastener..... S. J. Brown  
Mangle..... G. Horig  
Mantle support..... J. T. Lister  
Massage apparatus..... J. A. Reade Jr, et al  
Massage apparatus. Pneumatic..... R. Watson  
Match box..... C. Mutschening  
Match protector. Lighted..... H. C. Bowman  
Measuring distances of distant objects. Apparatus for..... T. D. Brown et al  
Measuring the area of surfaces. Machine for.....  
R. W. Strout  
Mechanical movement..... P. Bendixen  
Mine curtain raiser..... J. Wack  
Mining. Machine for washing and cleaning gravel in gold..... 2 pats. J. G. Camp  
Molding apparatus..... A. K. Beckwith  
Molding apparatus..... B. C. White  
Molding apparatus. Multiple..... A. K. Beckwith  
Money box..... J. A. Steinmetz  
Mosaic..... P. Semmer  
Motor controlling mechanism..... C. E. Ennes  
Mowing machine..... J. F. Steward  
Mowing machine..... P. Weyand  
Music leaf turner..... A. D. Crist  
Music rack..... J. J. Neumann  
Musician's exercising device..... A. E. Jones  
Net making machine..... W. R. Pihl et al  
Nitro compounds. Reducing..... M. Buchner  
Nut. Axle..... P. Dansereau  
Nut and washer..... H. T. Love  
Nut lock..... J. G. Waggoner  
Nut lock..... I. W. Hoffman et al  
Nut lock..... J. V. Berry  
Nut lock..... C. H. Chittum  
Oar. Bow facing..... E. S. McCauley  
Oil burner..... C. W. Sievert  
Oil vapor burner..... A. J. Lindemann  
Oils for medicinal use. Preparing..... P. Lewy  
Oiling and cooling bearings of vertical shafts. Device for..... J. H. Baker et al  
Ore separator..... C. F. Lancaster  
Ore sizer or classifier..... W. B. Gilmore  
Paint and making same..... J. E. Kollinger  
Painting apparatus..... S. A. Worcester  
Paper box..... reissue. 2 pats. J. A. Scott  
Paper box blanks. Roll for cutting.....  
W. G. Cowell  
Paper box. Knockdown..... A. W. Beers  
Paper cutting machine..... M. G. Ferrahan  
Pea huller..... E. G. Albaugh  
Peat block. Composite..... W. A. Milne  
Pedometer..... W. E. Porter  
Pen extractor..... P. Grabler  
Pen holder..... M. M. Woodworth  
Perfumes and disinfectants. Making J. Bardin  
Petroleum. Desulfurizing crude.....  
A. W. Burwell et al  
Phonograph attachment..... E. Gilbert  
Phonograph starting and stopping mechanism.....  
E. Gilbert  
Photographic developing apparatus.....  
F. S. Davenport  
Photographic diaphragm-adjusting mechanism.....  
A. Brandweiner  
Photographic objectives. Shutter for.....  
E. Branburger  
Photographic printing machine. C. Spaulding  
Pile driver buffer..... L. P. Friedstet  
Pipe and nut wrench. Combined A. W. Hjorth  
Pipe connection..... A. W. Cram  
Pipe coupling..... F. R. Waters  
Pipe wrench..... W. Littley  
Pipes or other articles. Hanger or support for.....  
W. F. Irish  
Packet closure..... 3 pats. H. A. Taylor  
Plane..... A. W. Stanley et al  
Plane..... A. W. Stanley et al  
Plastic composition..... A. Eichengrum et al  
Plastic material. Forming articles composed of.....  
L. Romero et al  
Playing pieces..... C. Sauer  
Plumber's blast furnace..... O. Bernz  
Pneumatic tools. Stroke changing mechanism for.....  
J. Keller  
Pocket..... W. Delavoye  
Poison holder..... W. J. Shelton  
Pool table register..... G. C. Beck  
Poultry of vermin. Apparatus for ridding.....  
F. Leveck  
Power producer..... O. E. Waxed  
Power wheels. Bucket or vane for impact.....  
F. M. F. Cazin  
Precious metals from their ores. Apparatus for extraction of J. Baxeres de Alzugaray et al  
Preserving basket..... J. Dowd  
Printing machine..... T. Cossar  
Printing press sheet jogging device.....  
J. W. P. Taylor  
Projectile. Explosive..... H. S. Maxim  
Pulley fastening..... A. W. Hight  
Pump..... J. G. Roth  
Pump. Electric air..... C. A. Eck  
Pumping engine. Duplex..... E. P. Worden  
Race horse starter..... M. Cassidy  
Race starting apparatus..... C. A. Chapman  
Raft construction. Mooring derrick scows in.....  
J. Ayres  
Rail clamp..... E. Gerrard  
Rail joint tie..... A. Kreps  
Rail system. Third..... J. H. Hughes  
Railway rail brace or tie bar..... W. E. Arthur  
Railway rail stay..... H. H. Spoenburg  
Railway switch..... W. K. Smith  
Railway switch signal..... A. J. Park  
Railway tie..... R. E. Heller  
Railway wagon..... M. Hoogstraeten  
Railways. Contact shoe for electric.....  
W. D. Young  
Refrigerator or cold storage room..... E. J. Wirfs  
Registering apparatus..... A. Pollak  
Registering machine..... J. Heissenberger  
Registering monetary transactions. Apparatus for.....  
J. Frydman  
Reostat..... W. V. Ash  
Roof. Portable..... W. Morris  
Rope clamp..... C. H. Mohland  
Rule attachment..... S. Murphy  
Saccharine juices. Defecting..... J. J. Hignette  
Sad iron..... W. A. Hammond  
Safety pin attachments. Anchor for.....  
W. S. Hankins  
Sander. Fluid operated..... F. H. Edwards  
Sash lock..... B. F. Cheshire  
Sash lock..... H. H. Meyer  
Sash lock..... M. B. J. Simonds  
Sash jointer..... W. M. Potter  
Saw set..... P. H. L. Klette  
Saw shifter for gang edgers..... F. W. Cook  
Sawing machine..... J. McCarthy et al  
Sawing machine. Wood..... A. S. Kendall  
Sawmill attachment..... D. W. Bartran  
Scale..... W. W. Palmer  
Sealer. Envelop..... W. M. Henry  
Sealing rings. Apparatus for making.....  
W. P. Coldren  
Secondary battery..... G. E. Hatch  
Sewer..... C. Wentz  
Sewing machine fan attachment..... F. Gerber  
Sewing machine needle..... G. L. Olsen  
Shade hanger..... J. P. Gerth  
Shaft attachment. Vehicle..... S. S. Langford  
Shaft borers. Contrivance for actuating.....  
H. Pattberg  
Shaft. Vehicle..... F. Graef  
Shafts. Device for securing parts to.....  
E. G. Hoffmann  
Sharpener for band cutter knives..... A. J. Heine  
Shingle gage..... H. M. Tinklaugh  
Ship's course recorder..... W. Maxted  
Shoe fastening..... L. A. Boehme  
Sign. Electric..... B. E. Salisbury  
Sign. Illuminated..... C. F. Lancaster  
Signs. Contact maker for electrical.....  
C. F. Lancaster  
Signal transmitting system..... E. B. Ellicott  
Signal waves. Amplifying electromagnetic.....  
reissue. 2 pats. J. S. Stone  
Sled. Hand bob..... H. G. M. Howard  
Sleigh..... J. R. Kyle  
Slider. Beet..... W. Kollmann  
Slimes. Device for treating W. E. Holderman  
Smoking pipe..... I. G. A. Pfortner  
Snow melting machine. Automatic..... A. Bass  
Sole and heel. Shoe..... F. A. Salaman  
Speed indicating apparatus. Vessel.....  
S. J. Lawrence  
Speed indicator..... E. J. Hodgson  
Spine stretching device..... C. G. P. Blomqvist  
Square. Machinist's try..... A. Duffy  
Stacker..... F. Wyatt  
Stamp holder. Postage..... J. H. Binney  
Stave pipe. Wooden..... A. Bannister  
Steam generator..... G. D. Cooper  
Steam generator..... C. Crompton  
Steam trap..... F. H. N. Gerwig  
Stereotype casting box..... C. S. Partridge  
Stethoscope. Binaural..... W. J. Penfold  
Still..... L. L. Roberts  
Stitching machine. Buttonhole..... E. B. Allen  
Stones. Making artificial..... F. Jurschina  
Store bin..... C. R. Reid et al  
Stove. Heating..... C. Faust  
Stove. Heating..... C. Matthews  
Stove radiator..... J. C. Meister  
Stoves. Apparatus for feeding liquid fuel to.....  
S. Trivett et al  
Stoves. Construction of heating..... C. W. Stauss  
Strainer. Waste pipe..... A. E. Lytle  
Street indicating device..... T. W. Small  
Street or station indicator..... E. Lundin  
Submarine communication. System of.....  
S. Lake  
Sugar juice treating apparatus..... J. A. Besson  
Sugar juices. Purifying and concentrating.....  
J. A. Besson  
Sulfur. Mining..... reissue. P. Higgins  
Superheater..... reissue. E. F. Edgar  
Superheater. Steam engine..... W. J. M. Dobson  
Superheater. Steam engine..... R. E. Law  
Suspender end..... A. M. Ziegler  
Switch operating device..... W. K. Smith  
Switch operating mechanism..... W. J. Hynes  
Switch operating mechanism B. J. Delzeit et al  
Switch throw..... C. C. Korus  
Switchboard. Electric..... W. F. Bossert  
Syringe nozzle..... H. Brown  
Tablet. Adhesive..... G. Schmalzfuss  
Tablet. Memorandum..... G. A. A. Weber  
Tablet or Book. Manifold..... F. J. Cota  
Tag stringing machine..... F. A. Suck  
Talking or sound reproducing machines. Interchangeable sound amplifying means for.....  
A. S. Marten  
Teeth with porcelain. Filling..... R. K. Belden  
Telegraphic transmitter..... J. P. Conaway  
Telephone alarm system..... J. D. Peachey



Telephone apparatus. Automatic..... J. J. Brownrigg et al  
Telephone system..... J. W. Lattig et al  
Telephone system..... J. J. Brownrigg et al  
Telephone systems. Calling mechanism for automatic..... 2 pats. J. J. Brownrigg et al  
Theater chair. Folding..... O. Markiewicz  
Therapeutical purposes. Electro-vibratory apparatus for..... F. H. Brown  
Thill coupling..... 2 pats. W. E. Sherwood  
Threshing machine riddle..... E. Huber et al  
Ticket spindle..... H. M. Barnett  
Tile..... S. T. Playford  
Time recorder..... A. N. Palmer et al  
Time recorder..... W. W. Kimball et al  
Tire and manufacturing same. Vehicle..... C. D. Nirdlinger  
Tire for vehicle wheels. Cushion..... J. N. Dages  
Tobacco flue screen..... A. G. Floyd  
Toilet cabinet..... W. A. J. Newell  
Tongs..... A. Brinkmann  
Toy. Detonating..... 2 pats. C. E. Moore  
Toy folding bell..... A. C. Healy  
Toy. Locomotive..... D. B. Clark  
Trace. Harness..... D. K. Bellis  
Traction wheel..... H. Spurrier, Jr  
Train controlling mechanism. Automatic..... A. E. Osborn  
Train stop. Emergency automatic air..... J. R. Van Daniker  
Tramway. Aerial wire-rope..... C. T. Finlayson  
Tramways. Automatic bucket loader for aerial wire rope..... C. T. Finlayson  
Tramways. Dumping device for aerial..... C. T. Finlayson  
Tramways. Friction grip for wire rope..... C. T. Finlayson  
Tramways. Lock clip for connecting buckets to traction ropes of aerial wire rope..... C. T. Finlayson  
Trap clean out..... J. & J. W. Buckley  
Trolley for electric railways having overhead wires for supply of current..... A. Fayol  
Trolley pole of electric tram cars or the like..... C. R. F. & R. J. Hommel  
Trolley retractor..... R. H. Ham  
Trolley stand..... J. J. Bouchard et al  
Trousers..... L. W. Hammond  
Truck and body bolster..... 3 pats. A. Lipschutz  
Tube cutting machine. Metal..... T. L. Carbone  
Tubular boiler..... W. T. Fox  
Tubular covering. Flexible..... J. Stanley  
Turbine. Steam..... H. Richter  
Turn table operating mechanism..... J. T. McGrath  
Turning and boring apparatus..... G. Nardin  
Type distributing device..... F. Winkler  
Type writer..... C. J. Paulson  
Type writer carriage operating mechanism..... W. W. Baer  
Type writing machine..... J. H. Hotson  
Type writing machine carriage escapement..... G. W. Singleton  
Type writing machine spacing mechanism..... L. Schlesinger  
Umbrella..... J. Lingel  
Valve for hydraulic engines or machinery..... 4 pats. A. Patterson  
Valve for regenerative furnaces. Water sealed reversing..... H. Prentice et al  
Valve mechanism for rock drills..... T. Officer  
Valve or similar structure. Piston..... C. Reeves  
Valve. Steam reducing..... L. B. Fulton  
Valves or dampers. Indicator for thermo electric regulators for..... W. E. Mack  
Vapor burner..... J. J. Atkins  
Vehicle gear..... F. E. Wilcox  
Vehicle. Motor..... W. S. Rogers  
Vehicle tops. Resilient rest for T. F. Gensmer  
Vehicle. Water..... H. A. Hansen  
Velocipede. Water..... N. R. Dungee  
Vending machine..... J. R. Williams  
Vending machine..... W. L. Holloway  
Vending machine..... D. James  
Vessel. Semisubmersible..... S. Lake  
Vibrating screen..... F. W. Rogers et al  
Vibrator engine..... W. Lewis  
Wagon bed attachment..... W. Whitlock  
Wagon jack..... J. Heritage  
Washing machine..... W. S. Miller  
Watch movement holder..... C. H. Jenkins  
Watchmaker's gage..... C. H. Jenkins  
Water cooler equipment..... J. T. Cole  
Water heater and coffee urn..... H. F. Hankins  
Water heater. Electric..... J. W. Ewart  
Water level indicating apparatus..... M. Gehre  
Water tube boiler..... F. R. Tibbitts  
Waterways. Structure in or adjacent to..... G. L. Monchel  
Weeder tooth..... A. J. Patton  
Weighing apparatus. Automatic..... A. R. Leich et al  
Well drill and reamer. Deep..... P. Higgins  
Well reamer. Oil or Artesian..... P. Higgins  
Wells. Portable rig for pulling oil..... F. W. Pennell  
Whiffletree clip..... T. J. Bullock  
Whiffletree connector for braces..... R. J. Lay  
Wick. Lamp..... F. Limper  
Wind instrument mute..... J. J. Neumann  
Windmill..... J. T. Ham  
Window..... W. Eccles et al  
Window frame and sash..... C. B. Schilling  
Wire clamping device..... S. S. Withington  
Woven fabric..... H. J. Mackintosh et al  
Wrench..... J. La Burt  
Wrench..... W. A. McGuire et al  
Wrench..... A. J. Mayer  
Zinc and chromium hydrates. Making..... I. L. Roberts

## DESIGNS.

Alphabet..... A. Blonde  
Dish or similar article. Almond..... C. A. Bennett  
Fire alarm box..... 7 pats. W. L. Denio  
Floor or wall covering..... A. H. Commis  
Floor or wall covering..... T. J. Anson  
Plate..... G. R. West  
Spoons, forks, for similar articles. Handle for..... E. Crees et al  
Teapot or similar article..... A. F. Jackson

Issued September 15, 1903.

## MECHANICAL PATENTS.

Abbrading tool..... J. O. Rollins  
Acetylene generator..... J. M. Green  
Adjusting device..... L. Myers

Advertising apparatus. Aerial E. A. Ward et al  
Advertising frame..... C. McGinn  
Advertising machine..... M. J. Jordan  
Agricultural implement..... 2 pats. D. Lubin  
Air compressor..... G. De Laval et al  
Air cooling apparatus..... 2 pats. W. G. Bloss  
Atomizing device..... W. Sams  
Auger. Earth..... A. Butenbach  
Auger. Earth boring..... A. M. Bevier  
Automatic switch..... J. F. McElroy  
Ax. Folding..... C. P. Wing  
Back band and trace carrier..... J. H. Estes  
Balance. Spring..... J. M. Triner  
Baling press..... W. E. Tate  
Bandage making machine..... F. L. Pohlmann  
Barometer alarm..... G. Vives  
Basins or the like. Screen for catch..... W. H. Woods  
Basins, sinks, or like fixtures. Attachment for..... W. Ford  
Bearing. Roller..... J. Hutchison  
Bed sunner and clothes drier..... K. C. Moore  
Bedstead fastener..... J. M. Nichols  
Bicycle..... C. L. Travis  
Bicycle alarm..... R. Lewitz  
Bicycle cushion frame..... C. L. Travis  
Bicycle riders or other performers. Trackway for..... C. R. Culver  
Block mold..... P. B. Miles  
Blower..... F. F. Wilson  
Boat coupling..... I. H. Larr  
Boats. Automatic diving mechanism for submarine..... F. W. Brady  
Boiler furnace. Steam..... C. B. Rearick  
Boiler gage and alarm. Steam..... E. Thompson  
Boiler safety device. Steam..... D. E. Reagan  
Bolt..... G. E. Woodbury  
Book holder..... G. Boden  
Bookcase. Sectional..... J. L. Kershaw  
Boot or shoe polishing machine..... C. Biladeau et al  
Bottle making machine..... A. S. Reeves  
Bottle. Non refillable..... H. Mackenzie  
Bottle stopper..... A. J. Kempien  
Bottle washing machine..... J. A. Prince  
Brake shoe..... A. L. Streeter  
Bridge..... J. B. Strauss  
Bridle bit and horse controlling device..... J. O. Fowler, Jr  
Broiler for gas stoves..... H. H. Phillips  
Broom clasp..... F. S. Smith  
Buckle..... E. M. Sharpe  
Building construction..... J. T. Simpson et al  
Burglar alarm..... F. Walder  
Burner..... F. F. Dow  
Button..... J. W. Force  
Button. Collar..... W. Birdzell  
Camera. Photographic..... S. Wacht  
Can..... E. Eckart  
Canopy supporting frame..... I. E. Palmer  
Car brake..... T. E. McCollum  
Car door. Freight..... P. McMullen  
Car door. Grain..... E. J. Geske  
Car door. Grain..... F. W. Canales  
Car draft rigging. Railway..... 2 pats. H. C. Williamson et al  
Car fender with brake attachment. Automatic..... W. K. Given  
Car mover..... R. Miller  
Car or other vehicle stopping device..... J. P. Angell  
Car, &c. Postal..... L. M. Rich  
Car systems. Group indicator for freight..... E. B. Johns  
Carbon of great decolorizing power. Obtaining..... R. Ostrejko  
Carpet stretcher..... P. Kirst  
Carpet stretcher..... W. F. Kalberg  
Cart. Ash..... J. C. Lehr  
Cartridge shell decapping and recapping tool..... M. Chick  
Casting machine..... S. W. Bradley  
Casting machine..... F. N. Cline  
Cattle guard..... G. C. Frownfelter  
Cement kiln..... S. R. Malone  
Cement or artificial stone. Machine for making products of..... W. E. Jaques  
Centrifugal machine..... H. Winter  
Charging apparatus..... C. Mercader  
Chart. Garment drafting..... O. Hillman  
Checkrein spring. Over..... J. R. Cooper  
Clocks. Gravity escapement for W. Willmann  
Clothes line holder..... C. J. Archibald  
Clutch..... E. F. Bradley et al  
Coal tar composition and pitches. Manufacture of..... F. J. Warren  
Coke oven. Regenerative..... H. Koppers  
Compensating system..... F. G. Baum  
Compressor..... F. G. Baum  
Compression coupling..... J. Hutchison  
Concentrating machine..... T. H. Hicks  
Concrete piles. Making..... F. Shuman  
Conductivity bridge..... W. Hoopes  
Contact parts. Non interchangeable..... R. Hundhausen  
Cooling and filling apparatus..... A. Juif  
Copying machine. Letter..... E. J. Mankiewicz  
Corn husking and fodder shredding machine..... S. S. Creider et al  
Corset. Orthopedic..... F. Haas  
Cotton opening and cleaning machine..... D. J. Winn  
Cotton stalk puller..... G. W. Hardin et al  
Counting mechanism..... G. A. Wall  
Cover and strainer. Milk pail E. M. Haymaker  
Cover. Frying pan..... M. B. Covert  
Cracker or cake stacking machine C. J. Alfred  
Crate. Metallic..... R. S. Johnson  
Cream separator..... H. S. Hunt  
Cross head..... D. C. Berry  
Crupper..... W. W. Lyon et al  
Current compensating system. Alternating..... L. A. Hawkins  
Current transformer. Alternating..... D. C. Jackson  
Curtain fixture..... H. D. Whipple  
Cut out or circuit changer. Thermal..... G. E. Hoglund  
Dental instrument..... A. T. McMillin  
Dial. Educational, advertising, computing, recitation, exhibition, and display..... E. S. Morton  
Die cutting machine..... J. F. Keller  
Die cutting machine..... H. W. Kupfer et al  
Disintegrator..... J. M. Schutz  
Display stand..... J. H. Kamerer  
Display stand for doors, &c..... G. W. Raum  
Door closing and bucket tilting device..... J. F. Rule  
Doubling apparatus..... U. E. Dennis  
Draft equalizer..... R. Trett et al

Driving mechanism. Change speed... A. King  
Driving mechanism. Change speed... A. L. Cushman  
Drying apparatus..... M. Hecking  
Drying, lustering, and stretching machine..... J. Boivin  
Dust. Separator for apparatus for removing..... D. T. Kenney  
Dye and making same. Monoazo..... O. Sohst  
Dye and making same. Yellow acridium..... O. Sohst  
Dye. Anthracene..... R. Bohn  
Dye. Red mordant azo..... G. Ernst et al  
Dyeing brown..... E. A. Fourneaux  
Eggs. Preserving..... C. Bache-Wing  
Electric alarm lock..... O. E. F. Himmigoefer  
Electric circuits. Thermal cut out or fuse for..... R. Hundhausen  
Electric lighting system..... J. F. McElroy  
Electric lock..... W. MacMillan  
Electric machine brush holder. Dynamo..... H. M. Acly  
Electric machine. Dynamo..... E. A. Edwards  
Electric meter..... L. Gutmann et al  
Electric motor controller..... C. W. Kennedy et al  
Electric regulator..... G. Wright et al  
Electric resistance apparatus..... R. Hopfett  
Electric switch..... A. H. Babcock  
Electric switch..... W. H. Spiller  
Electric switch..... B. W. Woldridge  
Electric translating apparatus..... P. C. Hewitt  
Electrical apparatus..... W. J. Lloyd  
Electricity meter..... L. J. Aron  
Electromagnet..... C. M. Hedman  
Electrotherapeutic apparatus. Hydro..... D. C. Fisher  
Elevating and dumping apparatus..... R. Hollopeter  
Elevator..... J. F. White  
Elevator reissue..... J. F. Sandersen  
Elevator door fastener..... H. C. Clausen  
Elevator safety device..... G. Hail  
Engines. Charge inlet device for explosive..... F. Charron et al  
Engines. Detachable trunnion and supplemental wheel for traction..... H. C. Clay  
Eraser holder..... F. W. Hock  
Explosive engine..... W. W. Tuck et al  
Explosive engine..... W. J. Wright  
Explosive engine..... 2 pats. J. H. Redfield  
Fastener..... L. Reiter  
Faucet safety attachment..... A. Steele  
Feed box..... E. M. Pumphrey  
Feed water heater and purifier..... J. Angell  
Fence stay fastener. Wire..... S. E. Jackson  
Fence wire holding device..... H. D. Whipple  
Fertilizer mixer..... R. A. Moore  
Fifth wheel..... E. P. Gaines  
File. Detachable letter and bill H. R. Gentsch  
Filter..... F. Bommaris  
Filter pads. Mold for making..... E. M. Knight  
Fire escape..... W. F. Epperson  
Fire escape..... D. Heath  
Fire extinguisher..... J. E. McWilliam  
Fire kninder..... J. Adler  
Fireproof floor and ceiling construction..... J. T. Simpson et al  
Fireproof window sash..... J. W. Rapp  
Fishing line float..... D. R. Lewis  
Flax breaking machine..... G. H. Ellis  
Flax straw preparing machine..... G. H. Ellis  
Flue expander..... J. W. Faessler  
Food container..... A. Buntentbach  
Form. Garment..... W. F. Palmenberg  
Furnaces. Apparatus for feeding bagasse to..... J. Fisher  
Furnaces. Plant for feeding material to blast..... W. Kennedy  
Furnaces with fuel and promoting combustion thereof. Supplying..... W. W. Weaver  
Fuse. Electric..... G. B. Baby  
Gage..... A. A. Handley  
Game..... A. E. Borland  
Game apparatus..... J. E. Carney  
Game counter holder..... E. Ocumpaugh  
Garment supporter..... J. A. Crandall  
Gas burners. Shade clip for incandescent..... H. W. Royal  
Gas generator. Acetylene..... W. S. May  
Gas generator. Acetylene..... L. Snyder  
Gases containing sulfuric acids. Purifying..... H. Rabe  
Gasoline burner..... A. J. Blackford  
Gasometer..... N. Goodyear  
Gate..... T. F. Timby  
Glue applying machine..... G. A. Eusign  
Gluing machine..... W. F. Epperson  
Gold and silver. Treating tellurid ores of..... C. E. Baker et al  
Gold separator..... W. Snee  
Governor attachment..... W. H. Beckett  
Grain drill..... J. H. Kindsater  
Grain drill..... H. C. Ham  
Grain or the like. Appliance for elevating and discharging..... J. & F. H. Haviland et al  
Guns. Coupling for the trail and limber of field..... O. Stoekle  
Hame and tug connection..... J. C. Curryer  
Hame strap..... W. H. Gailor  
Handcuff..... N. A. Burdick  
Hat fastener..... J. C. & E. D. Shultz  
Hay rake..... L. O. Knapp et al  
Hay rakes. Foot trip for horse E. A. Johnston  
Head gear and ear trumpet. Combined..... T. W. Messenger  
Headlight. Locomotive..... E. D. Bangs  
Heat regulator. Thermostatic..... A. M. Butz  
Hertzian waves. Apparatus for polarization of..... F. J. Green  
Hinge..... L. P. Krisner  
Hoisting, holding, and lowering device..... H. F. James  
Hose or tubing..... F. M. Marcy  
Hot air engine..... W. R. Kennedy  
Hot air furnace..... R. J. Crozier et al  
Hot air furnace..... J. H. Tuttle, Jr  
Hydrocarbon burner..... J. E. Bancroft  
Hydrocarbon burner and furnace D. C. Wilgus  
Ice creeper..... J. H. Wagner et al  
Ice freezing can..... E. E. Haumer  
Igniter. Electrical speaking..... C. W. Miller  
Ignition device. Electric..... A. R. Mosler  
Incandescent mantles. Machine for manufacturing..... J. L. Muller et al  
Injector..... C. Linstrom  
Insulated joint for railway rail sections..... G. A. Weber  
Insulated rail joint..... J. J. Gunn  
Insulator for electric wires..... H. Bottjer  
Irrigation ditch damming machine..... H. H. Urquhart  
Joiner..... G. A. Caton

Journal box lubricators. Holder for..... J. R. Harrison  
Key ring..... J. S. Lewis  
Kneading machine..... M. E. Beasley  
Label holder..... W. M. Kreidler  
Lacing hook setting machines. Stop for..... J. Pierce  
Lacing stud setting machine..... I. F. Peck  
Lamp. Arc..... W. C. Fish  
Lamp chimney holder..... A. L. Higgins  
Lamp. Hydrocarbon incandescent P. B. Curran  
Lamp wick adjuster..... B. F. Chesire  
Lath spacing table and tie..... A. H. Bowlzer  
Lens grinding machine..... E. M. Long et al  
Level and grade finder. Combined C. J. Weber  
Lighting arrester and protector..... J. Davis  
Liquid fuel and air burner..... P. Blodgett  
Locking mechanism..... R. W. Goeb  
Loom. Filling replenishing..... O. A. Sawyer  
Loom shuttle..... B. Crossley  
Loom shuttle lock..... F. A. Mills  
Lubricator..... W. C. Meelings et al  
Mail box indicator..... H. Schmid  
Mailing tube..... H. L. Stafford  
Mailing tube clip..... F. J. Ganaway  
Manhole terminal for conduit sections..... G. M. Gest  
Massage instrument..... J. W. Hyatt  
Match box holder and safe. Combined..... C. F. Paige et al  
Mattress. Wire..... J. D. Haggard  
Mechanical movement..... M. Burton  
Mechanical movement..... J. M. E. Pfrom  
Metal. Expanded..... E. A. Mallory  
Metals dissolved in mercury. Apparatus for oxidizing..... C. E. Baker et al  
Metals from their compounds. Electrolytic process of recovering..... C. E. Baker et al  
Meter..... J. A. Tilden  
Microscope. Binocular..... F. E. Ives  
Mirror for ladies' hats..... B. A. Potter et al  
Miter box..... M. Nicholls  
Molding apparatus..... W. E. Stuart  
Motors. Means for starting and regulating induction..... R. D. de Lignieres  
Mower bar..... A. C. Rioux  
Muffle furnace..... T. Hardie  
Muffler. Exhaust..... G. F. Swain  
Musical instrument..... L. Johnson  
Musical instruments. Tracker board attachment for pneumatic..... A. Anderson  
Nail puller for tires..... H. P. Wilmarth  
Necktie fastener..... W. A. Chapple  
Needle. Broom..... E. D. Palmer  
Oil burning apparatus. Heavy..... F. Cotton  
Oil extracting device..... R. D. H. Anderson  
Ophthalmoscope..... H. L. De Zeng  
Ores. Disintegrating..... C. T. Snedeker  
Ores. Treating..... F. Laist  
Packing and storing vessel..... J. C. O'Shea  
Paper jogger..... L. B. Taylor  
Pavement. Asphalt..... F. J. Warren  
Pea shelling machine..... J. H. Empson  
Pen filling device. Fountain..... H. Taylor  
Pen for recording machines. Fountain..... O. C. Patton  
Pen. Fountain..... J. Barnes  
Perforation spacing device..... A. S. Seville  
Photographic apparatus..... S. Wacht  
Piano..... P. Duffy  
Piano action. Grand..... T. T. Fischer  
Piano hammer felts. Device for loosening..... F. Behringer  
Picture frame..... J. Santenma  
Picture molding bracket..... W. L. Rummel  
Piling. Sheet..... L. P. Friedsted  
Pillars or similar uprights. Base for porch..... J. Schug  
Pipe coupling. Train..... A. Herpolsheimer  
Pipe die. Sewer..... T. W. Jones et al  
Pipes and fittings. Apparatus for stopping leaks in..... D. T. Pitkethly et al  
Pipes. Apparatus for removing obstructions from..... J. E. S. Taylor  
Pitman connection..... E. A. Johnston  
Plaue. Bench..... C. E. Lincoln  
Plow..... J. W. Lee  
Plow. Disk..... H. M. King  
Plunger. Self adjusting..... C. F. Marsh  
Pneumatic underblast and stacker..... A. H. Van Houwelingen  
Pole changer..... T. W. Warner  
Potato digger..... W. I. Skinner  
Power driven machinery..... D. C. Jackson  
Power feeder..... J. M. Schutz  
Power transmitting apparatus. Liquid..... C. C. Palmer  
Precious metals from their ores. Extraction of..... J. Baxeres de Alzugaray  
Press for squeezing mushy, zinky, or coppery lead drosses..... W. H. Howard  
Pressman's tray..... C. Bradley  
Printing and folding machinery. Sheet delivery apparatus for..... C. T. Cundall  
Printing attachment for calculating machines..... W. H. Pike, Jr  
Printing. Color..... P. Barboutan  
Printing press..... F. H. Lindner  
Printing press bed motion..... H. Hartt  
Printing press bed motion..... R. Miehle  
Printing press front sheet delivery apparatus..... A. Stocker  
Printing presses, &c. Slant board for..... G. R. Williams  
Propeller..... E. Claudio  
Pulley..... H. H. Boyce  
Pulley..... E. S. Buckley  
Pump..... J. B. O'Donnell  
Pump..... I. W. Hills et al  
Pump..... Z. Storch  
Pump or bailer. Sand..... M. C. White  
Pump. Rotary..... J. Nielsen  
Pumping device. Oil well..... H. F. James et al  
Rail bending and breaking device..... J. Rodenberger  
Rail chair..... G. E. Raitz  
Rail joint connection..... J. Houlehan  
Railway. Electric..... W. N. Stewart  
Railway. Pleasure..... H. B. Gentry  
Railway street indicator..... I. M. Koch  
Railway signaling. Track instrument for..... L. R. Hummel  
Railway signals. Circuit breaker for automatic electric..... R. A. Doty  
Railway surfacing and lining device..... J. M. Bailey  
Railway tie..... A. A. Raymond  
Railway tie and rail fastening..... P. H. Quinn  
Railway vehicle..... G. Gibbs  
Railways. Automatic signal for electric..... C. B. Campbell  
Razor frame. Safety..... A. W. Scheuber



Receptacle. Folded.....J. C. O'Shea  
Rheostat.....W. C. Yates  
Road roller sprinkler attachment R. D. Aldrich  
Rolling mill gearing.....J. Fawell  
Rotary engine.....H. L. Humphrey  
Rotary engine.....J. M. Farmer  
Rubbing machines.....A. Lawson  
Sad iron. Self heating and extinguishing.....T. Hawkes  
Safety shears.....C. Grant  
Sand crushing mill.....M. Drury  
Sand trap and strainer.....H. Blueher  
Sandpapering machine pad.....C. C. Stuart  
Sandpapering machine pad mechanism. Supplemental driving means for.....C. C. Stuart  
Sash fastener.....R. A. Broadhurst et al  
Sash lock.....J. Ross  
Saw.....P. M. Way  
Sawmill.....T. S. Wilkin  
Saw sharpening implement.....G. Y. Anderson  
Sawing machine.....T. S. Wilkin et al  
Scale. Spring.....M. H. Wilson  
Scales. Attachment for spring balance.....J. F. Milligan  
Scenic apparatus.....F. W. Thompson  
Screw cutting machine. Wood.....R. Dicke  
Seal.....L. E. Wood et al  
Seal lock.....C. W. McShane  
Seal. Self-locking.....2 pats.....E. Tyden  
Sealing rings for canning jars. Making lipped.....W. P. Coldren  
Sewage treating and utilizing apparatus.....R. J. G. Wood  
Sewing machine hemmer.....A. J. A. Oesterreich  
Sewing machine needle bar mechanism.....E. B. Allen  
Sewing machine take up device.....P. Diehl et al  
Sewing machine thread-cutting device.....E. B. Allen  
Sewing machine welt guide. Shoe.....C. H. Cook  
Sewing machines. Rotary take-up for.....P. Diehl et al  
Shade fixture. Adjustable.....C. J. Wiltzie  
Shade or curtain holder.....D. W. Driscoll et al  
Sharpening machine. Disk.....O. O. Goodenow  
Sheaf carrier.....J. W. Parker  
Shearing machine. Directacting steam.....W. J. Fogarty  
Sheet and envelop. Combined communication.....J. W. Rice  
Sheet and envelop. Combined writing.....E. Eckart  
Self guard and advertising medium. Combined.....E. Frank  
Ship loading or coaling device.....J. Tarr  
Shocker.....H. W. Johnson  
Shoe attachment.....J. N. Scism  
Show case.....T. H. Betty  
Shuttle.....J. G. King  
Signal light.....E. A. Edwards  
Signals. Make and break switch for electric.....C. B. Campbell  
Skylight.....R. Lieber et al  
Snap hook. Safety.....O. W. Sanborn  
Snap switch.....R. H. Read  
Soap flaker.....W. G. Hawley  
Soldering iron handle. Detachable.....J. J. Vigo  
Soldering machine. Can.....S. A. Baker  
Spacing table.....A. Clarke  
Spark arrester.....F. E. Rogers et al  
Spark plug.....H. C. Folger  
Speed device. Variable.....H. E. Kellogg  
Speed regulating device.....M. W. Alexander  
Spinning frame top roll.....J. J. Weiss  
Split.....J. R. Moore  
Square. Jointed.....H. G. Bogert  
Stairway. Traveling.....E. Baltzley  
Steam generator.....D. A. Walton  
Steering gear. Hand and power.....C. Green  
Stirrup.....M. H. Green  
Stool.....F. D. Foote  
Storage battery.....F. A. Redmon  
Store service apparatus. Take up device for.....W. L. Churchill  
Stove.....W. Bell  
Stove.....W. Heuermann  
Stove and lamp. Combined oil.....J. Wister  
Stove controller.....G. L. Groudhall  
Stove. Oil.....J. L. Berge  
Stove or furnace chimney valve.....P. Meehan  
Surface cooler connected with a sediment removing device. Closed.....V. Lapp  
Sweetmeats. Making.....E. Shaw  
Switchboard.....B. Beerwald  
Tackle block.....H. W. Stocking  
Talking machine.....H. E. Booth  
Tank mold.....W. Bryan et al  
Tannin. Extracting.....M. Honig  
Target for miniature ranges.....F. M. Gaudet  
Target trap.....W. A. Holland  
Telemotor apparatus for ships, & A. B. Brown  
Telephone.....M. I. Vought  
Telephone apparatus.....W. Kaisling  
Telephone bracket. Adjustable.....E. J. Murphy  
Telephone lock.....W. H. Scott  
Telephone system.....S. A. Duvall  
Telephone transmitter.....H. D. Stroud  
Telephone transmitter.....D. O'Brien  
Tellurian.....J. L. Van Nort  
Thermometer shield. Clinical.....H. Vaughan et al  
Thill coupling.....J. M. Bryant  
Tile. Building.....H. Ohaus  
Time register.....J. L. Roberts  
Tires. Inner tube for pneumatic.....T. R. Palmer  
Tobacco pipe.....D. B. McAllister  
Tool. Combination.....R. A. Baggett  
Tool handle fastening.....R. E. Appleton  
Tooth bar guide and arrester.....T. S. Wilkin  
Torch. Gasolene.....F. Reinlein  
Toy.....A. J. Keck  
Toy.....F. Garrecht  
Toy.....J. V. Keane  
Toy shooting apparatus.....H. Kunzel  
Trace fastener.....A. Wagner  
Trace fastener.....J. M. McCormick  
Trace holder.....J. M. Bryant  
Train stop. Automatic safety.....H. G. Sedgwick  
Transformer.....R. R. Wiley  
Trap and thimble. Combined.....J. Crawford  
Trolley.....H. E. Myers  
Trolley.....E. E. Frederick  
Trolley alarm and indicator.....W. H. Hillyer  
Trolley harp.....H. A. Ripley  
Trolley wires. Suspension of.....M. T. A. Kubierschky et al  
Trousers hanger.....E. C. Hyland  
Truck.....E. Peckham  
Truck. Car.....2 pats.....E. Cliff

Truck. Car.....E. Peckham  
Truss.....S. H. Phillips  
Turbine. Steam.....H. Kugel et al  
Type writer tabulating stop.....H. L. Wagner  
Type writing machine margin paper guide.....L. Myers  
Type writing machine paper release device.....J. C. McLaughlin  
Type writing machine ribbon feeding mechanism.....W. H. Pike, Jr  
Type writing machine ribbon reverse mechanism.....L. Myers  
Umbrella stand lock.....W. Holl  
Upright boiler.....C. R. Smith  
Valve disks. Tool holder for machines for cutting.....F. L. Smith  
Valve lock and adjuster.....A. B. Loomis  
Vapor burner.....J. Lawson et al  
Vegetable or meat cutter.....W. F. Wagner  
Vehicle dumping box.....D. T. White  
Vehicle rub iron.....J. B. Erhart  
Vehicle steering mechanism. Motor driven.....E. Haynes et al  
Vehicle wheel.....L. Biava  
Vehicle wheel.....A. B. Kern  
Vent controller for barrels. Air E. R. Charles  
Vest. Skeleton.....C. G. Funk  
Violin bow.....M. B. Roark  
Wagon brake.....R. Love  
Washing machine.....J. M. Lemmon  
Watch. Stem winding and setting.....C. Kuenzel  
Water heater. Electric.....W. E. Heal  
Water meter.....J. G. Potter et al  
Water meter. Rotary.....F. L. Northrop  
Water motor.....F. J. Humphrey  
Waterworks. Pneumatic.....E. L. Canou  
Watering trough. Automatic.....J. A. Brown  
Wave motor.....F. J. Hagen  
Way bill.....W. F. Mullahy  
Weighing machine. Automatic.....G. Prokoflew  
Well boring and rock drilling machine. Combined.....S. H. Powers  
Winding indicator.....A. Anderson  
Window dust guard.....F. R. Simms  
Window screen.....E. S. Giles  
Wire drawing machine.....2 pats J. H. O'Donnell  
Wire machine. Barb.....E. Williams  
Wrench.....H. E. Ercauback  
Wrench.....H. R. Ashby

## DESIGNS.

Cup.....M. A. Haley  
Dish.....M. A. Haley  
Dish. Covered.....M. A. Haley  
Floor or wall covering.....F. D. White  
Grave mark.....E. T. Whelan  
Mirror or similar articles. Pendent A. Harris  
Plate.....M. A. Haley  
Saucer.....M. A. Haley  
Store. Gas.....W. M. Craue  
Teapot.....M. A. Haley  
Tiling.....R. L. Chipman

Issued September 22, 1903.

## MECHANICAL PATENTS.

Adjustable holder.....W. A. Dickinson  
Air brake coupling.....J. Shourek  
Air brake mechanism.....reissue. T. J. Quirk  
Air compressing apparatus.....F. E. Bachman  
Air compressor.....L. M. Sartain  
Album, toilet box, and writing desk. Combined photograph.....R. Aizenman  
Animal leg brace.....N. P. Allen  
Automobile speed indicator.....J. W. Sutton  
Ax handle protector.....J. C. Dalrymple  
Bark from standing trees. Apparatus for removing.....W. P. Kidder  
Barrel machines. Gripping device for double stavevener.....B. W. Truscott  
Bat separating and folding machine.....D. Williams  
Bath apparatus. Vapor.....L. Mohr  
Battery terminal. Storage.....J. W. Madigin  
Bearing.....E. C. Ahlheim  
Bearing. End thrust ball.....M. Reid  
Bearing. Roller.....R. Treveal  
Bed attachment.....A. H. Sommers  
Bed bottom. Spring.....J. W. Terry  
Bed canopy support.....H. G. Schuette  
Bed. Invalid.....W. McLennan  
Bed sheets in position. Means for holding.....F. Kahl  
Bee smoker.....H. Root  
Bicycle extension frame. Seat supporting.....G. S. Akers  
Bicycle luggage carrier.....F. C. Johnson  
Binder frame.....A. H. Loreuz  
Biscuit cooling apparatus.....G. Herbert, Jr  
Blast furnace.....M. Blanchard et al  
Bleaching compound. Making M. Ruthenburg  
Bleaching yarn cops.....J. E. Bland et al  
Blotter.....E. K. Nelson  
Boat or vessel.....H. J. Bayard  
Boat. Submarine.....L. Y. Spear  
Boats. Compensating device for submarine or submergible.....L. Y. Spear  
Book leaf turner.....W. Gumnitz et al  
Boring machine.....H. B. Binsse  
Bottle.....A. F. Oxley  
Bottle package.....F. Jones  
Bottles, jars, or similar receptacles. Stopper for.....F. R. Wilkins  
Box fastener.....2 pats.....C. W. Beeher  
Box lid support.....J. C. Hatch  
Brake shoe.....H. J. Jones  
Brake shoes. Making.....W. D. Sargent  
Brush. Toilet.....C. S. Baylor  
Buckle. Belt.....J. L. Brower  
Building construction.....F. W. Spencer  
Burglar alarm.....P. Lievens et al  
Burial casket.....J. Stan  
Burner and automatic valve.....E. H. J. C. Gillett  
Bushings. Bung.....T. Pendergast  
Cabinet.....2 pats.....B. W. Sholly  
Camera detachable lens board.....F. B. Case  
Camera front.....F. B. Case  
Camera lens board clamp.....F. B. Case  
Cans or jars or the like. Device for closing or fastening fruit.....G. B. Ertell  
Capping block.....C. C. McDonald et al  
Car draft rigging.....I. O. Wright et al  
Car. Metallic.....C. M. Carnahan  
Car. Semiconvertible.....W. M. Smith  
Car. Steel caboose.....T. J. Glyn

Car. Street.....J. A. Brill  
Cars. Arm rest for semiconvertible or other.....S. M. Curwen  
Cars or the like. Sand box for railway.....H. E. Haddock  
Card or picture mount.....W. H. H. Hutton, Jr  
Carpet cleaning machine.....J. Lewandowski  
Carriage top joint breaking device C. A. Colleen  
Cash and credit account cabinet.....C. Yorger  
Cash register.....W. A. Zimmerman  
Cash register.....J. P. Cleal  
Cash register.....F. J. Nutting  
Cashier. Mechanical.....I. S. Dement et al  
Casing spear.....W. W. Stockton et al  
Casket.....J. D. Ripson  
Casket. Couch.....F. N. Watt et al  
Centrifugal separator.....A. L. Christenson  
Chair attachment. Barber.....C. L. Wendt  
Chair, step ladder, and trestle. Combined.....E. J. Darling  
Chlorate powder.....W. M. Spore  
Churn. Rotary.....H. E. Bonney  
Cigar box lid supporter.....A. G. Shade  
Cigar bunch cutter.....T. A. Anderson  
Cigarette mouthpiece applying machine.....J. S. Beeman  
Clamp.....J. Vogt  
Clasp.....T. S. Bennett  
Clasp.....C. J. White  
Cloth pressing device.....J. Lynn  
Clothes drier.....M. S. Nolan  
Clutch. Friction.....L. Mayer  
Coffee or tea infuser and strainer F. A. Wegner  
Coloring matter. Blue.....R. Bohn  
Column. Making metallic.....J. F. Clutter  
Comb for holding false hair.....A. Roehm et al  
Concrete wall mold or form.....W. A. Kirk  
Confessionary instrument. Auricular.....W. H. Greis  
Conveyer. Traveling.....2 pats.....E. Baltzley  
Cooker and mixer. Combined corn J. F. Rutter  
Cooking utensil.....R. V. Jones  
Corn husker.....H. Coad et al  
Corn husking machine.....J. E. Goodhue  
Cotton separator.....R. Sobotka et al  
Counter and bin. Combined.....D. H. Braganis  
Covered box.....J. H. Fearis  
Cream separator.....S. A. Jones

Cryptographic perforator.....2 pats.....A. L. Day  
Cultivator.....S. L. Ailes  
Culvert.....E. C. Krupp  
Current transmitter. Coin controlled adjustable.....M. D. Compton  
Curtain fixture.....J. M. Mays  
Cuspidor. Automatically emptying.....A. M. Carter  
Cut off mechanism.....S. T. Muichie  
Cycle cushion truss.....C. E. Becker  
Cycle frame. Motor.....H. W. Freed et al  
Dental instrument.....W. J. Miles, Jr  
Dental spraying apparatus.....J. C. Holson  
Desk lock.....A. R. Fergusson  
Dish mop.....C. G. Townsend  
Disinfectant block.....C. C. Jenkins  
Disinfecting device.....W. H. Dayton  
Doors or covers to casings. Means for securing circular.....H. C. Lowrie  
Drawing press.....2 pats.....O. S. Beyer  
Drawing press.....W. Klocke  
Dredging apparatus.....D. F. Breslin  
Drier.....T. B. Howe  
Drying cylinders. Swivel water displacer for.....S. Smith  
Drying machine.....L. G. Laprade  
Drill.....J. Meyers  
Egg beater.....L. M. Galatius et al  
Eggs. Preserving compound for packing.....C. C. Therkildsen  
Electric braking.....F. E. Case  
Electric circuit controller. Thermostatic.....C. & G. Klopferstein  
Electric fixture. Support for.....C. A. Hannan  
Electric light signal.....V. Taboulevitch  
Electric lines. Apparatus for locating short circuits in.....W. W. Woodruff  
Electric motors. Controlling.....H. W. Buck  
Electric switch.....J. Harisberger  
Electrical controller.....G. C. Marx  
Electricity meter.....W. M. Mordey et al  
Elevator safety device.....G. Hail  
End play device.....H. Geisenhoner  
Engine tender. Traction.....G. M. Nellans  
Engines. Water cooler for motive power.....E. L. Cooper et al

Continued in November Number.

## Canadian Patents

Canadian Patents may now be obtained by the inventors for any of the mechanical inventions named in the foregoing list, provided they are simple, at a cost of \$30 each. If complicated the cost will be a little more. For full instructions address Inventive Age Publishing Co., 918 F Street N. W., Washington, D. C.

Foreign patents may also be obtained in certain other countries.

## The Manhattan Typewriter,

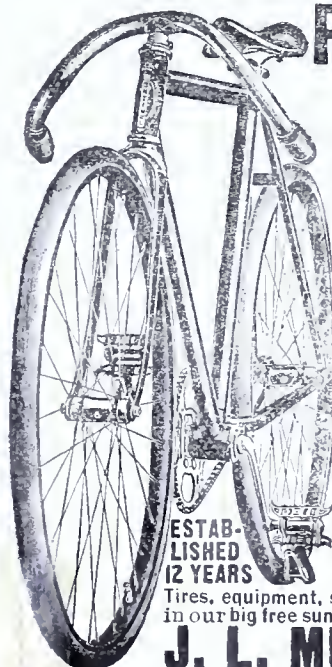
### Guaranteed to be of the Highest Grade.

NOT IN THE TRUST.

PRICE \$50.

JOHN C. PARKER,

619 Seventh St. N.W., Washington, D. C.



## RIDER AGENTS WANTED

in each town to take orders for our new High Grade Guaranteed Bicycles.

### New 1903 Models

"Bellise," Complete \$8.75  
"Cossack," Guaranteed High Grade \$10.75  
"Siberian," A Beauty \$12.75  
"Neudorf," Road Racer \$14.75

no better bicycle at any price.

Any other make or model you want at one-third usual price. Choice of any standard tires and best equipment on all our bicycles. Strongest guarantee.

We SHIP ON APPROVAL C. O. D. to any one without a cent deposit and allow 10 DAYS FREE TRIAL before purchase is binding.

500 Second Hand Wheels \$3 to \$8 taken in trade by our Chicago retail stores, all makes and models, good as new.

DO NOT BUY a bicycle until you have written for our FACTORY PRICES AND FREE TRIAL OFFER. Tires, equipment, sundries and sporting goods of all kinds, at half regular price, in our big free sundry catalog. Contains a world of useful information. Write for it.

**J. L. MEAD CYCLE CO., Chicago, Ill.**



AN ELEGANT REPRODUCTION OF A CHARMING

# \$75,000.00 Painting

Given Away



REDUCED ILLUSTRATION

"THE VILLAGE WEDDING"

FULL SIZE 25 BY 38 INCHES

FOR several years the publishers of the WOMAN'S HOME COMPANION have been searching for something, to give to their subscribers, that would ECLIPSE ANYTHING EVER OFFERED BY ANY PUBLISHING-HOUSE IN THE WORLD. At last, at great expense, they are able to make it possible for every home in America to possess a magnificent and faithful reproduction of one of the most remarkable paintings ever produced by mortal man in this or any other age. It secured for the artist the honor of immediate admission to the ranks of the Royal Academy. The original painting was shown all over Europe, and thousands upon thousands of people gazed upon it with rapture. It was quickly bought up for \$75,000.00, and placed in the position of honor in one of the most celebrated galleries in Europe, and no American money yet offered has been able to secure it for this country. The whole picture fascinates one with its absolute accuracy to life. Every figure in itself alone is a study that would make a wonderful picture. Every face is alive with the spirit of action. It is a picture of mirth and merriment; a picture to bring sunshine into every home and the heart of every one who gazes upon it. You cannot tell our engraving from the only other authorized reproduction, which sells in Europe for \$18.00 (eighteen dollars). Our exquisite reproduction is 25 by 38 inches, including margin, the exact-size of the costly European engraving, and will be a splendid addition to the art collection of any home, whether framed or hung without framing, a fashion now so much in vogue.

**WOMAN'S HOME COMPANION** This magazine is edited and made up in the city of New York, the leading literary and art center of America. It contains the most timely illustrated articles, the most beautiful illustrations, the best short stories, the most popular serial stories, the most practical household departments, the best of everything desirable for a home magazine. It is printed on the finest paper, has 44 to 60 large pages, 11 by 16 inches. The twelve numbers will contain more than one thousand beautiful illustrations. Each month it carries a message of help, profit, pleasure, education, culture and refinement to over two million readers. Its editors and contributors are the most popular American writers. It is altogether the cleanest, brightest, handsomest, choicest and best of American home magazines.

**\$7.00 for \$1.85**

"THE VILLAGE WEDDING,"	very, very cheap at \$5.00	A total value of \$7.00
WOMAN'S HOME COMPANION	one year, price 1.00	
INVENTIVE AGE & PATENT	one year, price 1.00	
= = INDEX = =		

**BOTH PAPERS ONE YEAR AND THIS PICTURE SENT TO ANY ADDRESS**

For  
Only **\$1.85**

In this offer, although paying less than the ordinary and regular price of the papers for a year, you get in addition the above-described charming picture ENTIRELY FREE.

The papers and picture in the above offer can go to different addresses.

THE ABOVE OFFER APPLIES TO OLD OR NEW SUBSCRIPTIONS.

SEND ALL ORDERS TO

**INVENTIVE AGE PUBLISHING COMPANY.**  
WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

# THE Inventive Edge

AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 11.

WASHINGTON, D. C.--NOVEMBER, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

## - - - USES OF TRACTION ENGINES. - - -

THE use of the traction engine and of the automobile threatens to interfere with the profits of railway companies. Some years ago, when the automobile began to come into general employment, one of the largest share holders in an electric railway in Washington took measures to dispose of his stock, saying that electric railways were doomed. They could not

cellent roads and relatively limited distances, the railways some time ago inaugurated motor car services to feed or supplement the existing train routes. Now, the trains themselves have stopped running between certain points where passenger traffic is light, and motor cars, capable of carrying, say, fifty people, have taken their place. The cars are stopped not only

chinery of balloon detachments, and iron and steel targets from place to place can be accomplished with relative ease by the use of the traction engine. During the Boer war, when the English desired to move the huge guns from the war ships inland to the centres of disturbance, it was found impossible to haul such loads across the unbroken veldt with spans of oxen,

and ditching machines. They may be utilized by pioneers in a new country, in logging operations. They can haul heavy loads of lumber across ground so rough as to be impracticable for horses: they can pull down trees, etc. In factories, for building operations, for road making, on steamship docks in connection with cranes—for a thousand purposes the traction engine



compete with the automobiles, since the latter did not have to carry the burden of an expensive plant and system of tracks, and could alter their course to suit changing conditions. The lack of good roads in the United States has hampered the progress of the automobile; but while it may be some time before we see it supersede the electric and cable railways, it is worthy of note that the prophecy above quoted is beginning to be fulfilled in England in the regular railway service. In that country of ex-

at the stations but at level crossings as well, and the economical and other advantages are too obvious to be noted.

The traction engine, also, takes the place of the locomotive for many purposes. In times of war, the first effort of the enemy is to destroy the lines of communication, and the road engine makes it possible within a very short time to completely change the base of supplies of an advancing army. The transportation of heavy siege guns across country: the moving of the ma-

and had the traction engines not been available, the war might have been indefinitely prolonged.

In times of peace, also, these engines have proved of great value, in driving dynamo, threshing machines, plows, etc. The illustration shows how, with the assistance of a portable windlass, anchors, and steel wire rope, together with a universal joint for coupling to the fly wheel of the engine, an eight furrowed plow may easily be set in operation. This applies equally well to harrows, disks, rollers, drawing

demonstrates its utility.

It is interesting to note that where there is much traffic by automobiles and traction engines, the roads are beginning to show the effect. The county surveyor of Surrey, England, has discovered a curious result of motor car traffic on dry roads in dry weather. The large rubber tires separate the small metal from the large and extract it, so that after a dry day one finds long lengths of road, where the surface had been perfect in the morning, covered with a fine, sharp



grit, which had been sucked up during the day by the rubber tires. Heavy motors going at a rapid rate tear gravel roads all to pieces, and the surveyor is in favor of making experiments with a view to discovering a better wearing surface. The road makers of the country will have to consider a new problem, with the increase of motor traffic. What was sufficient for country vehicles a few years ago is entirely unsuited to the changed conditions of today. Traction engines, concludes the surveyor, can haul heavy materials much more cheaply than railways, but in winter they do considerable damage to flint roads.

#### Electric Traction.

The third-rail system of electric traction, for which so much is claimed, is not widely used in this country, but has received more general application abroad. In Northern Italy, especially, are excellent facilities afforded for the study of this method, and a comparison with the more common system of overhead traction. The water that falls from the eternal snows of the Alps has been utilized for the generation of electricity, and for the transmission of power to long distances. Perhaps the largest experimental third rail system ever constructed is that running from Milan to Varese. This railway, according to an expert who has recently examined it, is a good example of a line with a large traffic worked electrically on the third rail principle. Its total length is 81 miles, and it has been in use, in part, for two years.

The wires of all the lines are supported by porcelain insulators fixed to wooden poles 131 feet apart. On some sections, however, there is an iron pole about every 32 feet. The third rail is placed laterally to the track, and is supported every 13 feet by artificial granite insulators on cast-iron foundation brackets, fixed to the sleepers. The rails are bound together by means of flexible copper connections, having a section of 8 inches.

The motor cars weigh 40 tons unloaded, and the trailers 25 tons, and can accommodate 76 passengers. Each motor car is driven by four 150-horse-power motors, each motor weighing 2 and a half tons. The goods traffic is to be hauled by electric locomotives. Every electric car is provided with a hand brake and a compressed air brake, for which, and for the air necessary for the whistle, an electric compressor of 4 horse power is placed under the frame. The current is taken from the third rail by means of four shoes placed at the four ends of each electric car. The shoes are supported by an iron angle fixed to the journal boxes of the trucks.

A high rate of speed is maintained by the train, occasionally averaging, on the level, full 65 miles an hour.

#### The Coldest Known Liquid.

Liquid hydrogen is by far the coldest liquid known at the present time. At ordinary atmospheric pressure it boils at -422 degrees F., and reduction of the pressure by an air pump brings the temperature down to -432 degrees, at which the liquid becomes a solid, resembling frozen foam. According to Professor Dewar, to whom the credit is due of having liquefied hydrogen in 1898, the liquid is a colorless, transparent body, and is the lightest liquid known to exist, its density being only one fourteenth that of water; the lightest liquid previously known was liquid marsh gas, which is six times heavier. The only solid which has so small density as to float upon its surface is a piece of pith wood.—*Cassier's Magazine*.

### ELECTRICITY IN AGRICULTURE.

ELECTRICITY is coming more and more into use for the operation of farm machinery. Especially in Germany where, owing to the limited area of individual holdings, the cultivation is intensive to the last degree, it has been adopted as motive power for a variety of apparatus. The greatest demand is probably for thrashing machinery, but it is also employed for driving pumps, hay presses, straw cutters, etc. It has many advantages over steam. Steam plows in conjunction with locomobiles, have, in the last quarter of a century, shown great advance over the work performed by hand or by animals: but the cost, the expense of fuel and attendance, the necessary water supply, their size and weight, form serious drawbacks to their extended employment. Locomobiles, owing to their long periods of inaction during

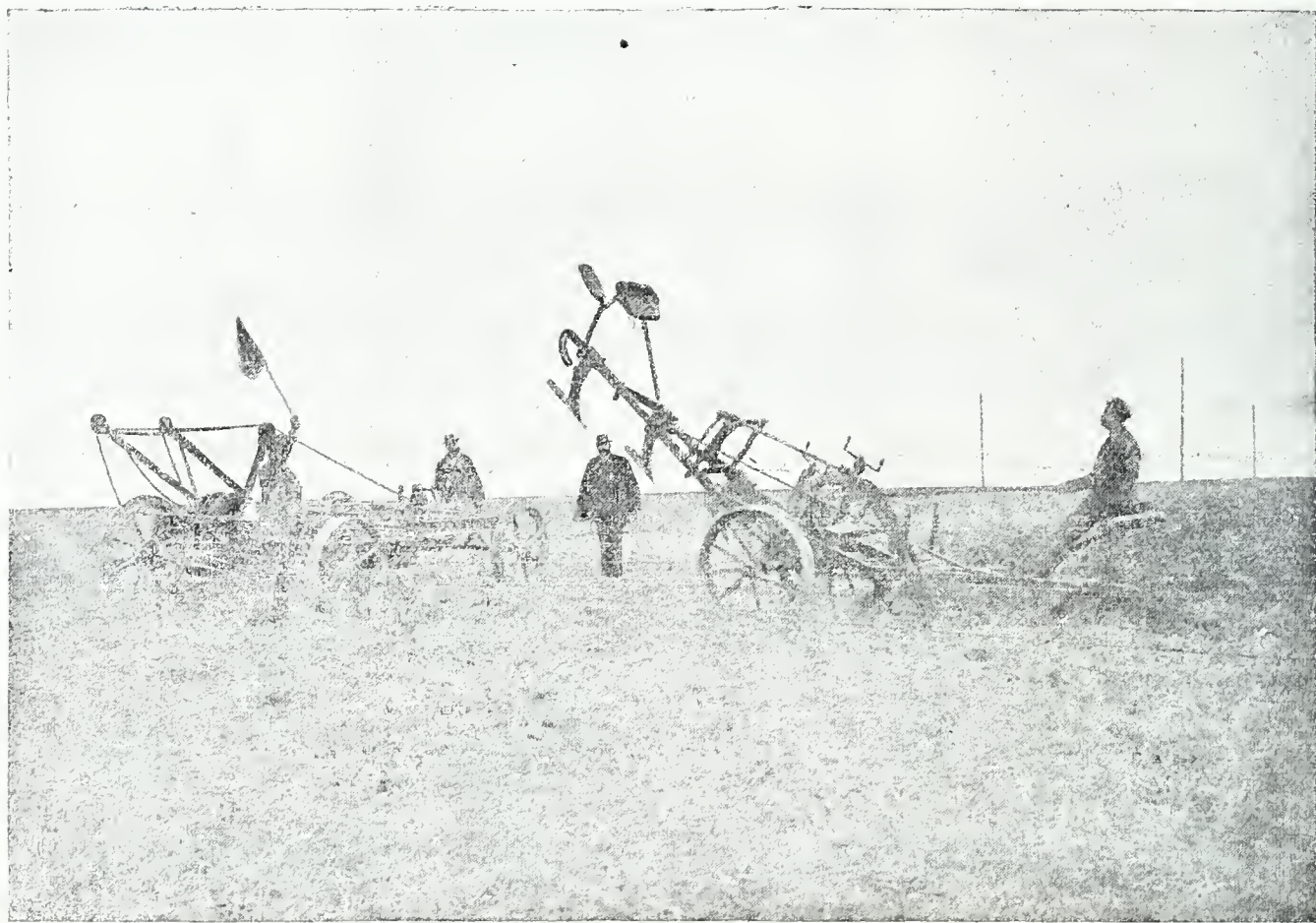
wheel or by indirect boltings. Suitable regulators must be employed, to prevent too much variation in the revolutions of the machine. Wires are carried from the dynamo to the field to be worked, in like manner as telegraph wires are borne, namely, on poles. According to the size of the field, the connection is either brought to the far end, or to the center. On account of the electric light being available at all times, work can be done, in times of stress, at night.

On one estate in Germany where electricity is used for all purposes, including the dairy, power is furnished by a small brook that drives a turbine wheel. This operates a dynamo, whence a current is sent to a switch board and distributed. Wires of different sizes conduct light and power currents to

ling the motors is so simple that any farm hand can readily understand it. The turning of a lever admits the electric current, and sets the motor in operation. One machinist, stationed at the turbine house, superintends the entire plant, handles the dynamo, and from time to time, inspects the motors when in operation. One intelligent farm hand can attend the thrashing machine and the large motor.

On another farm, where large electric plows are used, a stationary engine transfers its power through an electromotor to the plow, the motor being mounted on the plow itself, thus avoiding wire-rope traction. The anchor shaft of the motor sets in motion a double spur wheel, which, in turn, drives a pinioned shaft.

A chain extended over the field and held taut at both ends by triple ground anchors is worked by this pinioned shaft, which draws the plow along the chain across the field. On reaching the end of the chain, the plow is tilted to the other size, and



the year, waste an immense amount of motive power. Moreover, the rate of payment, for this very reason, is high.

Electromotors, on the other hand, are far less expensive to make; they are lighter in construction, and consequently more portable, they can also be used at a far greater distance from the actual source of power, thus saving much haulage. On large plantations, central stations are established for the electric power, which is transmitted by wires to the various points where it is desired to use it, but for smaller farming operations, it has been found practicable to obtain power from electric street car lines, or from some factory in the neighborhood.

In the central station, a dynamo machine of the requisite power is attached to the stationary engine by driving belts. Water power, where available, may be advantageously used to drive the dynamo, which can be effected either by taking the power direct from the turbine or the water

the yard, the main buildings, the stables, garden and fields. During the day, an accumulator in the turbine house is loaded, until it contains enough electricity to feed the lights during the night. By careful handling, this accumulator can be made to furnish illumination during five nights in succession, without reloading. To operate the machinery, there are two electric motors, one a fixed motor, to drive the pumps, a straw cutter, a turning lathe, a grindstone, and a large band saw, which cuts logs up to 18 inches thick. The other motor, which is the larger of the two, is mounted on iron wheels, and, together with the thrashing machine, can be put into any barn, to be connected there with the electric current by a small cable. The silos are built in a semicircle around one barn, and can be reached, to a distance of 500 feet, by cable attachments. The distance of the motor from the turbine is then about 1800 feet. The system of hand-

the simple reversal of the current sets the plow in motion in the opposite direction. In returning, it deposits the chain sideways ready for the next row of furrows. A laborer, by turning a lever, draws up the three ground anchors and thus sets the traveling wheels affixed to the anchor axles in motion, so that the anchors are easily moved to the next furrow. The motor tightens the chain before starting; the slack length of chain thus deposited behind the plow allows for any inequalities in length resulting from the shifting of the anchors, which are also provided with a spare length of loose chain for use in case of need. This plow is capable of plowing 12 acres to a depth of 14 inches within 8 hours, and the soil on the estate is heavy and loamy. It is stated that it effects great economy, the working expenses being less than half those incurred in working a steam plow. This is due to the fact that the capital invested in the plant is only about one



third that required for the steam plow, and the expenses connected with the generation of power being much lower, as in the steam plow, surplus power has to be raised in order to work the pulleys and brakes and to overcome the stiffness of the rope. On the farm above referred to, which has a complete electric installation, this power being used for digging potatoes and sugar beets, for sawing wood, pumping, cutting straw, etc., etc., it is estimated that the working expenses per year are hundreds of dollars less than by the old methods. Another advantage is that now four horses can be dispensed with, and the remaining horses are always ready for use.

The currents used are all of low tension and harmless to human life. High tension currents, it is true, could be used to better advantage on large farms, but they require more precaution. The cost of the machinery is greater, but a saving may be effected in the wiring, as high currents require thinner wires than low-tension ones. Furthermore, the loss of power in the former is very small, and machinery could be operated by them at a greater distance from the central station.

The accompanying illustration shows an electric plow in working order.

#### Polonium.

The latest scientific sensation is polonium, which is in many respects similar to the wonderful new substance radium, and which was discovered by the same persons—Professor and Madame Curie, of Paris. Like radium, it is a constituent of pitchblende, and it also has the same property of emitting continuously a vast number of particles infinitesimally small, without losing its luminous power of exhausting itself. In a much higher degree even than radium, it possesses the property of shining in the dark. Polonium is still more valuable than radium.

At the meeting of the Chemical Congress in Berlin, some interesting experiments were made with this new substance. There was exhibited a bit of polonium weighing fifteen hundredths of a grain, which had been produced from two tons of uranium at a cost of seventy-five dollars. This speck of polonium intercepted a strong current of electricity passing through the air from the generator to the receiver, the air ceasing to be a conductor for the flashes. The room was then darkened, and pieces of barium platinum and zinc-blende placed near the polonium, glowed with a bright, greenish light. Here is a hint, at least, of the future possibility of a constant and brilliant illuminant generated without heat or combustion; although of course, no one can say as yet how polonium can be adapted to practical use.

To keep themselves posted in the progress of the art in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

## ARMORED TRAINS.

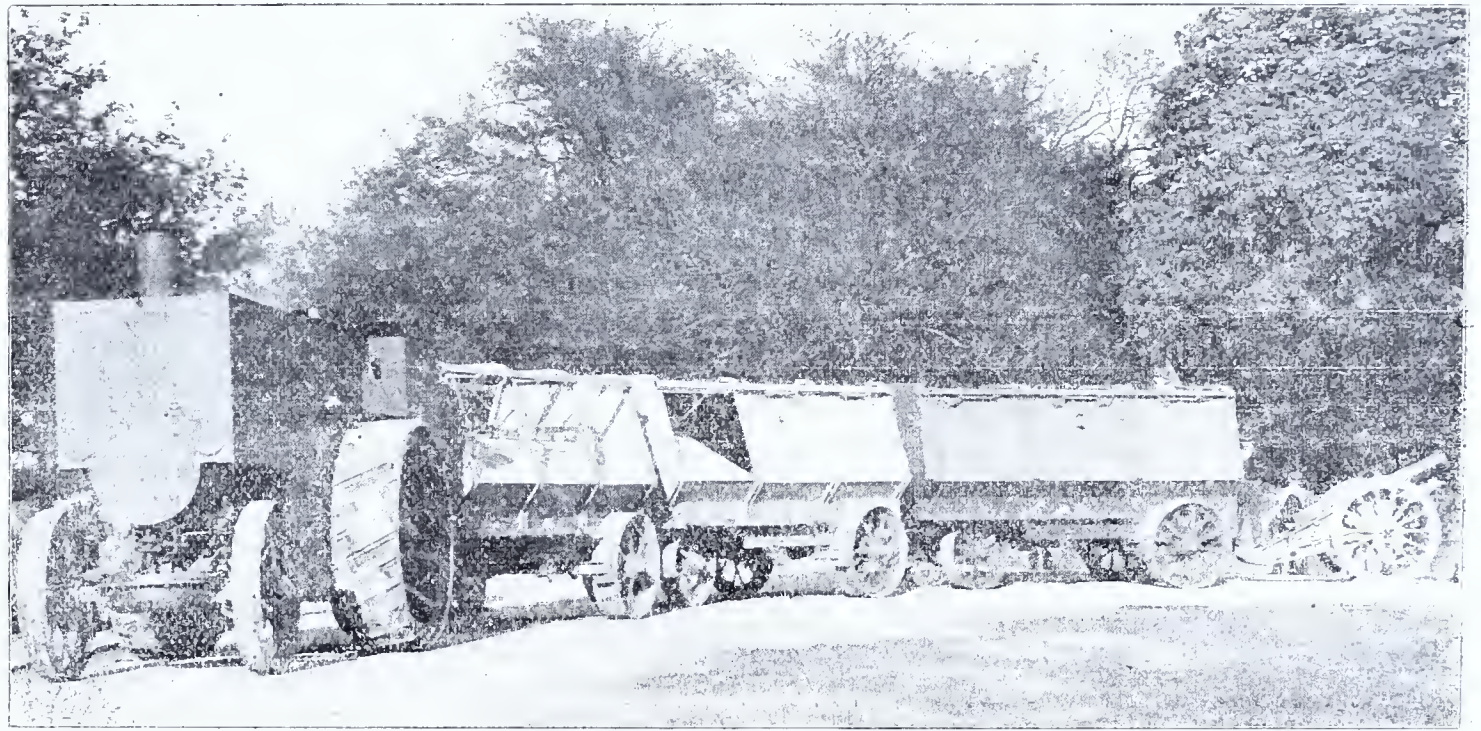
PERHAPS the most essentially modern instrument of war is the armored train. The accounts of these trains during the Boer war, and against the Filipino insurgents, have doubtless aroused the curiosity of many a reader to see just how they were constructed; and we take pleasure in showing, in the subjoined illustration, a photograph of an armored train in actual service. This particular train is adapted for use with a traction engine, in cases where the enemy has adopted the favorite practice of destroying the means of railway communication; but the cars for use on rails are built in the same way, only the wheels are different. The photograph shows how the cars are entered, the openings for the guns, and how the locomotive, also, is protected.

compensate for the recoil, and also to give steadiness and stability to the cars. This latter is accomplished by an arrangement for clamping the truck to the rails by strong screw clips, whenever the gun is fired. There are also several steel-plated vans accompanying the train in which horses and soldiers can be safely conveyed. This type of movable fortress performed notable achievements in South Africa, and in the sorties from Ladysmith and Kimberly, were the most effective weapon against the Boers. With machine guns and field pieces, the moving train becomes a valuable offensive apparatus, being able to move close to the enemy's lines or retreat to a point beyond the range of small arms. The rapidity with which the train can change its base of action renders it a

of the fugitive Agninaldo, in 1899. The work of the army was effectively supplemented, on this occasion, by an improvised armored train.

#### Development of the World's Steel Industry.

Of all the countries producing steel in 1902 the United States led, with an output of 15,000,000 tons. These figures grow in importance when it is remembered that the world's production in 1894 was only 12,851,000 tons. Germany's production in 1902 was 7,780,000 tons, one-half that of the United States; while England's was only 5,000,000 tons, or one-third the production of the United States. The world's total steel output for 1902 was estimated at 35,000,000 tons. This would indicate a growth of 700 per cent in twenty-two years, or an increase from a little more than 4,000,000 tons in 1880 to 35,000,000 tons in 1902. The great increase is due to the introduction and improvement of the processes, notably the flame furnace. Pennsylvania leads all parts of the world in the use of this furnace, fol-



ARMORED TRAIN PULLED BY TRACTION ENGINE

Although this implement of warfare has been given its first severe tests, as stated, within the last few years, it has been in use, to a limited extent, for the last quarter of a century. Credit has been given to Admiral Fisher, of the British navy, for the first use of the train, when, in 1882, he covered a locomotive with boiler plate and equipped cars, similarly protected, with field guns, and put them to effective practical use. But the idea dates back to the Franco-Prussian war of 1870, when the Germans invested Paris. The French then made frequent sorties from the city, assisted by field guns mounted on railroad cars, which were protected in their vital points against the enemy's guns. For the last twenty years, most of the military powers in Europe have been experimenting in this direction, and it is said that England has probably the most complete and efficient armored trains in the world. The model design of the British army was made specially for purposes of war; the protected engine carries a Maxim gun and the protected cars have heavy field guns, operated by machinery, so that any part of the surrounding country can be quickly covered. Arrangements are made to

difficult object for the batteries of an enemy to hit, and almost the only way to defeat its operations is to wreck or derail it; but the train illustrated here is independent of this method of attack.

Probably, the first attempt in the United States to provide an armored car was that made by the Michigan Central Railroad Company, on the order of the American Express Company, for the purpose of protecting the valuable articles carried on its special express trains. These "arsenal cars," as they are called, are so constructed as to make the centre of them, with its steel plating, a thoroughly bullet-proof room, with apertures so disposed as to enable the guards within to resist an attack by thieves from any quarter.

If this construction were generally adopted by the railways, it would go far toward diminishing the number of daring train robberies, accounts of which appear too frequently in the newspapers.

The armored train was also employed by the United States army, in the Philippines, and rendered efficient service, especially in the remarkable dash of our troops to the northern part of the island of Luzon, in search

lowed by Illinois, New England, Ohio.

The steel produced by the Bessemer process during the last fifteen years was used mostly for rails. In England more than half of the steel produced by the Bessemer process went into rails. In Germany and the United States the proportion is not so large. While the United States produced 9,306,471 tons of steel ingots in 1902, it turned out only 2,876,293 tons of steel rails, or about 30 per cent of the steel-ingot production. In Germany the amount of Bessemer steel put into rails is proportionately smaller. Because of the resisting power of the steel, the wear and tear on the rails is far less; but the manifold uses to which the steel can be put has taken away somewhat from the importance of steel-rail manufacture. The last twenty years has resulted in an age of steel. Three times as much steel is now produced as in 1894. The universal opinion seems to be that the production of steel is to go on increasing. If, during the next twenty years, the same rate of increase is maintained as marked the past, 1923 will see an advance of from 20,000,000 to 25,000,000 tons in the world's total production. In this enormous increase the United States, according to experts, is to play the important part. At the very least, this opinion seems reasonable. The United States now uses in a year 30,000,000 tons of the very best iron ore. In twenty years this would mean a total of 600,000,000 tons—possibly the exhaustion of the sources of supply.

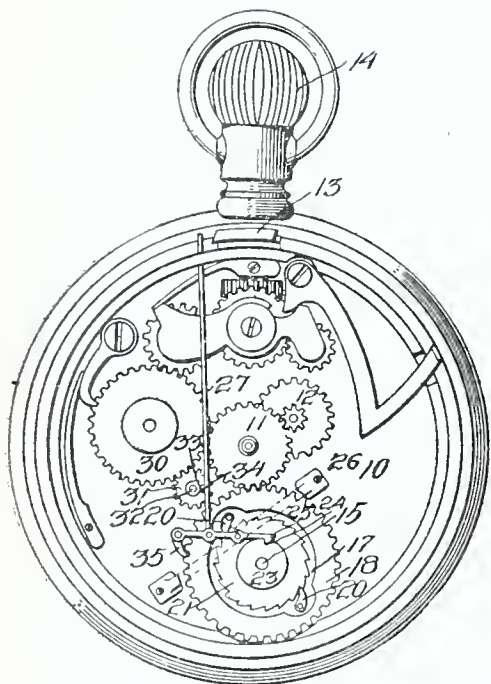


## CLEVER NEW PATENTS.

Watch Indicator.—Lamp-Burner Attachment.—Hame Fastener.—Cream Separator.

### Watch Indicator.

Felix E. Mistrot, of Galveston, Texas, has patented a unique structure to be employed in connection with watches and the like for indicating or calling the owners attention to the fact that winding is necessary. A catch is employed which engages with the under-cut arm or bezel of the watch-lid, and the locking movement of this catch is effected by the mechanism employed to rotate the hands. The catch is released during the operation of winding in order to permit the opening of the latch in the usual manner.



In the illustration, 10 designates the base-plate of the watch-movement, having the usual hour and minute wheels 11 and 12, and provided with setting mechanism of any desired character. The lid of the watch is adapted to be held in closed position by a catch 13, of ordinary construction, said catch being connected to the stem 14, so that when the latter is pressed inward the catch will be moved from engagement with the inwardly turned rim or bezel of the lid, and the latter opened by the usual case-spring. At a point below the hour-wheel, the base-plate is provided with a fixed stud 15, on which is mounted a gear-wheel 17, of a diameter double the diameter of the hour-wheel 11, and on the upper surface of said auxiliary gear is mounted a toothed ring 18, of similar diameter, and adapted to engage with the hour-wheel 11, the ring receiving one complete revolution during each twenty-four hours and serving to impart such movement through its pawls 20, and the ratchet-wheel 21, to the lower gear-wheel 17, the wheel and ring being capable of independent movement in one direction, but being locked together by the pawls and ratchet-wheel when moved in the opposite direction. Secured to or forming part of the ratchet-wheel is a disk 23, having a notch 24 for the reception of a detent 25, pivoted intermediate of its length to a cross-bar 26, carried by the base-plate and extending over a portion of the gear-wheel and ring, the arrangement being such that at the end of each twenty-four hours the detent will be engaged in the recess. Pivoted to the detent 25 at a point on that side of the detent-fulcrum, opposite to the notched disk, is the inner end of a locking-bar 27. The opposite end of the locking-bar is guided in a slot or opening at the flanged periphered portion of the base-plate, and is adapted to be projected for a sufficient distance to engage the bezel of a watchcase-lid and hold the latter securely locked until the winding mechanism is operated.

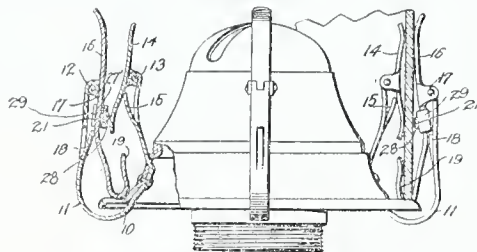
On the winding-post is arranged the usual locking-wheel 30, and intermesh-

ing therewith is a pinion 31, mounted on a stud 32, carried by the base-plate of the movement, said pinion being provided with a cam 33, which may engage a projecting shoulder 34, carried by the locking-rod, to cause a downward and releasing movement of said rod as soon as the watch-spring is partially wound. This inward movement of the locking rod serves to elevate the engaging end of the detent from the notch or recess in the disk 23 as soon as the contact arm or cam comes into engagement with the locking-rod. If no provision were made for moving the notched disk immediately after the movement of the rod, the detent would re enter the locking-notch as soon as the winding-stem was released, and to guard against this, a small pawl 35 is provided at the outer end of the detent, said pawl engaging in the teeth of the wheel 17, and serving on the downward movement of the locking-rod to effect a rotative movement of the notched locking disk to move the notch portion from a position under the engaging end of the detent. When the wheel 17 is turned, the ratchet-wheel slips around past the pawl carried by the toothed ring 18, and does not impart any movement to the hour-wheel, which would tend to change the position of the hands of the watch.

### Lamp-Burner Attachment.

A lamp-burner attachment has been devised by Mr. Albert L. Higgins, a well known inventor of Bar Harbor, Maine. The principal object of the invention is to more firmly hold the lamp-chimney in position and prevent accidental displacement of the same from various causes by increasing the friction between the chimney and its holding-prongs.

A further and important feature of the invention is to lessen the difficulty experienced in placing the chimney in position, the prongs in some classes of ordinary burners being sprung inwardly to such a degree as to make it a matter of much difficulty to place the chimney properly in position.



The burner represented in the drawings is of the ordinary construction, having a base-flange 10, to which is riveted a suitable number of supporting-prongs 11. These prongs are substantially U-shaped in form, and are provided with eyes 12 and 13 at their upper ends for the reception of suitable pivot-pins carried by the chimney clamps. The inner end of each prong extends up through a suitable opening formed in the base-flange of the burner, and at its upper end supports a clamp 14, adapted to fit within the chimney, the lower portion of said clamp being thrust outwardly by a spring finger 15, formed by stamping out a small tongue from the metal of the prong. The upper end of the clamp is projected inwardly to a point beyond that which it occupies when clamping the chimney in place, so that but little difficulty will be experienced in placing the chimneys in position, the distance between the upper portion of diametrically disposed clamps being less than the internal diameter of the chimney. When the chimney is forced down to the base-flange, the lower portion of the clamp 14, will be pressed inwardly against the action of the spring 15, and the movement of the clamp on its pivot will result in bringing both the upper and lower portions of said clamp into intimate contact with the inner surface of the chimney. The outer portion of the prong supports a clamp 16, having

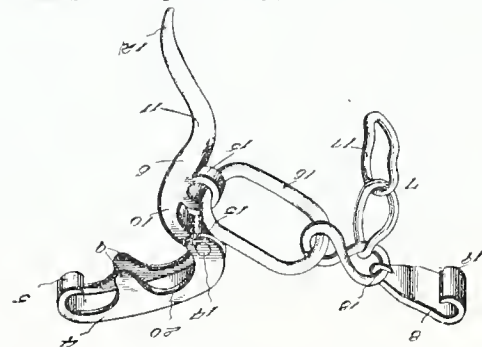
suitable integral lugs 17 for the support of pivot-pins, and the upper end of said clamp is projected outwardly beyond the outer line of the chimney by a spring-tongue 18, formed by stamping out the metal of the prong, said tongue bearing against the clamp at a point below its connection with the prong. The lower end of the clamp 16 terminates in a hook 19, which serves to support the chimney in place, the inner portion of the bill of the hook binding slightly against the inner surface of the chimney when the latter is in place. The entrance mouth formed between the adjacent inner and outer clamps 14 and 16 is much wider than the thickness of the chimney, so that the latter may be readily inserted in place, and when forced down into position will be firmly clamped and held from accidental displacement, the inner clamp being held in frictional contact with the inner surface of the chimney, and the outer clamp being held in contact at one point with the inner surface of the chimney, and at two points with the outer surface thereof, there being also additional frictional contact with the outer surface of the chimney by the friction block 21.

### Hame Fastener.

A unique hame fastener, very simple in structure and yet efficient in operation, has been patented by Mr. Edward E. Bull, of Whitwell, Tennessee.

The object of the invention is to provide simple and effective means for connecting the lower ends of the hames and in a positive manner to prevent accidental separation thereof, and to construct the fastener in such manner that it may be readily and easily operated to release the hames when desired, whereby adjustment may be quickly obtained to compensate for variations in the sizes of collars and to change the degree of binding stress of the hames on the collar.

The hame-fastener comprises a clip 4, provided at one extremity with a hook 5 to engage one of the hame-loops 3, a setting or tightening lever 6, pivotally associated with the opposite extremity of the clip, a series of links (designated generally by the numeral 7) connected with the lever, and a double-hook plate 8, adapted to engage, respectively, with the other

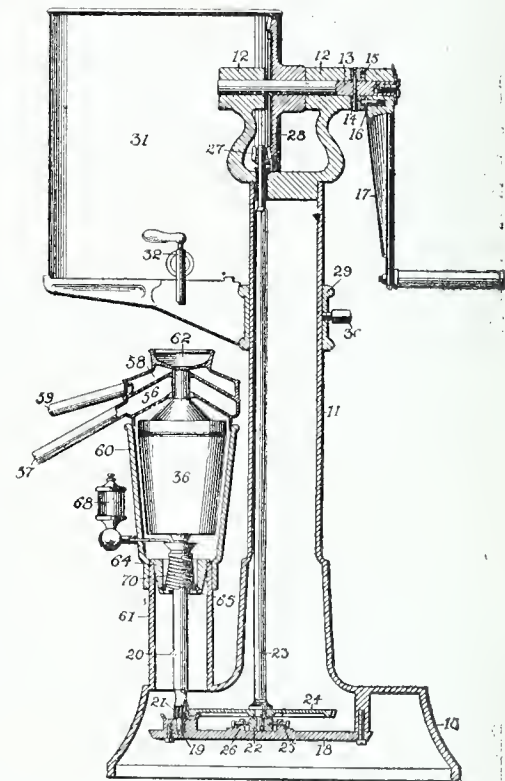


loop of the hame and with one of the series of links 7. The clip is a hollow structure made either of cast metal or drop-forged to the appropriate shape and is provided intermediate of its ends with two inward curved or deflected projections 9, constituting spring locking-jaws, to embrace the setting-lever and hold the same associated with the clip 1, thereby positively preventing accidental separation or disconnection of the lever from the clip when adjusted. The back of the clip is curved, as is also one terminal portion of the lever, as at 10, thereby to permit the lever snugly fitting within the clip when in locked position, the other terminal portion of the lever being incurved, as at 11, to fit over the hook 5 and outturned at its extremity, as at 12, to permit the lever being readily grasped by the fingers when it is to be unlocked. By thus constructing the lever and the clip the lever is caused to lie flat upon the clip and upon one member of the hames, thereby obviating the presentation of an obstruction which might be struck by an object, and thus unlock the lever.

### Cream Separator.

Messrs. Edward F. and Leander J. Hedderich, residents of Flora, Indiana, have devised important improvements in that class of cream separator which depend for separation upon centrifugal force.

One of the principal objects of the invention is to provide a centrifugal separator of this class in which the full milk will be discharged in the bowl at a distance from the center of rotation greater than that which the butter-fats and lighter portions of the liquid would naturally assume in the bowl if fed at a central point and then forced outward by centrifugal force. When the globules of butter-fats are discharged in a zone greater than



that warranted by their specific gravity, the adhering particles of liquid, being subjected to abnormal centrifugal force, will more readily separate from the butter-fats than if subjected to the lesser influence in that position which the butter-fats would ordinarily assume, and the separation is more readily effected, owing to the fact that the heavier and purely-liquid element is being forced toward the outer portion of the bowl, while the lighter butter-fats tend to seek a zone nearer to the center of the bowl.

There is provided at the lower portion of the bowl a reticulated or similar screen through which the full milk must pass in order to break up any tendency of the entering milk to form bowl-currents and to divide the milk in such manner that it will gradually rise in a practically even layer and without setting up any independent swirling currents. A frusto-conical separator-bowl is employed in which the skim-milk outlet is directly at the point of largest diameter of the bowl, the "separator-milk," as it is termed, being forced to travel the full limit of the bowl and subjected to the highest centrifugal force which the apparatus is capable of developing. Improved means are also provided in the form of radially-disposed blades having their outer edges in contact with the inner surface of the bowl to prevent lagging of the fluid and cause the same to travel at the same speed as the bowl. The invention furthermore provides an improved form of skimming-cone having discharge-passages arranged in such manner as to form free outlets for the cream and milk and, further, to employ the inlet-tube for the full milk as a means of connecting the bowl and skimming-cone, permitting the ready removal of the latter in order that access may be had to the bowl for the purpose of cleaning the same.



## TEA CULTIVATION AND CURING IN INDIA.

TEA is cultivated in India on well-cared-for tracts of level or mountainous land. The term "gardens" is given to these tracts, which vary in size from 100 acres in the hill districts of the lower Himalaya Mountains to 1,500 acres on the plains.

The tea bush is raised from seed, which is now carefully planted about 1 inch deep in a nursery of soft, fertile soil. In the early days of tea planting the seed was sometimes scattered broadcast from the back of an elephant. The young plants require a rich soil and a very moist heat in order to thrive well. When the plants have obtained a height of 12 inches, they are transplanted. It is generally considered that a bush requires about 16 square feet of well-cultivated soil around it to gain the best results. The tea is planted in regular rows, either in squares or triangles.

By the third year the plants should be from 4 to 5 feet high, and they are then pruned down to about 20 inches, so as to promote the growth of new branches and tender shoots and thus produce a larger number of new leaves. The methods of pruning vary greatly, and in some cases the plants are pruned before they are taken from the nursery. The bush is so pruned and trained that instead of growing tall it is kept short and broad in order to furnish a greater plucking surface. When the young bushes have developed succulent shoots upon which there are 4 or 5 leaves they are said to have produced their "first flush"—that is, they have sprouted sufficiently to pluck. During the rains successive "flushes" occur at intervals within fifteen to twenty days, varying according to the soil, cultivation, and climate.

The top part of the shoot is the only portion that is plucked. It includes the bud and the first two or three leaves, according as fine, medium, or coarse tea is wanted; for tea can only be made from the young and tender leaves, and the younger and tenderer the leaf the better the quality of the tea.

Plucking is performed by turning the thumb downward and nipping off the shoot between the thumb nail and the forefinger. It is done almost entirely by women and children, as it is comparatively easy work and does not require any physical strength. Each plucker carries a large open-mouth bamboo basket about 2 feet in diameter and 3 feet in length, tapering toward a rounded bottom. The leaf is thrown into this basket and protected by a covering from the rays of the sun, which would otherwise heat the tender leaf and cause it to turn red. Late in the afternoon the leaf is brought to the factory, where it is carefully weighed and examined by the manager and his assistants and the several amounts entered in a book against each plucker's name.

When the leaf has been weighed, it is taken to the withering rooms, where it is thinly and evenly spread upon

wide trays arranged in tiers from 6 inches to 2 feet apart, one above the other. This work is performed by men, who, with wonderful dexterity and rapidity, spread the leaf over the trays, making a pound of the green leaf when properly spread cover about 1 square yard.

By morning the leaf is sufficiently withered to be rolled without being broken. This is the test of withering, for a fresh stalk will break if bent only a little, while a stalk of withered leaf can be bent double without snapping.

The leaf when thoroughly withered is gathered off the trays and carried in baskets to the rolling machine. The object of rolling the leaf is to liberate the juices of the leaf cells and to give it a twist or roll. During the operation of rolling, the leaf changes color slightly, turning from a verdant green to a slightly yellowish color. The leaf is rolled for about thirty minutes at a time.

In former days this rolling process was all performed by hand, and even at the present time it is so conducted in China. A good day's work for one man was about 80 pounds of rolled leaf, but with the ingenious rolling machines that are now used in all Indian tea factories, it is possible to roll two or three times that amount in one hour.

The rolled leaf is then taken to a cool, dark, moist room, where it is spread out on a cement floor, or in long trays, and covered with wet cloth. It is left to ferment or oxidize, which turns the leaf to a dull, rusty color. This fermentation is the most important process in the preparation of the tea leaf, for it is necessary to have the leaf reach just the right point of fermentation, or else the flavor and appearance will be greatly changed. There is no general rule for the length of time that this operation requires. The leaf of one garden may take six hours of fermentation, while that of another garden may not stand more than two hours.

After the process of fermentation is considered to have proceeded far enough, the leaf receives another rolling of a few minutes and is then placed in the firing machine, where the fermentation is instantly stopped and the moisture of the leaf removed. In the first firing the leaf is subjected to a blast of hot air between 240° and 300° for twenty minutes, which causes it to curl up and blacken. It comes out of the machine about three-fourths fired, and is then fired a second time at a much lower temperature. It is now dry and crisp, with a delicious aroma, and is the tea of commerce.

The leaf is then taken to the sorting room, where it is weighed and the amounts entered in a book, so that at the end of the day the amount of manufactured leaf can be compared with the amount of green leaf from which it was made. It is usually estimated that about three-fourths of the weight of the green leaf is lost

during the process of manufacture.

After weighing the tea, it is emptied on a cement floor, where women carefully pick out any foreign matter—such as little sticks and pieces of stone—which somehow find their way into the mass of tea. When it has been properly inspected it is ready to be sorted into the different grades which are sold in the market. This is done by means of a long sieve, which is operated by power, in which are wire meshes of different sizes. The rough tea is put into a hopper at one end and the sieve is moved backward and forward at a rapid rate, causing the tea to gradually work its way to the other end. The tea that drops through the different meshes is called "unbroken tea," which is the finest grade, as it is made up of the tip of the bud and the delicate part of the leaf. Such tea as is unable to find its way through the meshes traverses the entire length of the sieve and falls into large baskets. It is placed in a machine where it is broken up fine, and then this broken tea is again sifted and automatically sorted in various grades in the same manner.

Just before the tea is to be packed into chests, it is refired for a very short time in order to drive off any moisture that may have been absorbed from the atmosphere during the time it has been away from the drying machine.

The amount of tea packed in a chest is usually 100 pounds, but as some teas are much finer than others it is possible to pack much more tea, bulk for bulk, of one kind than of another. Machines are now employed to pack the chests by which 20 to 25 chests can be packed in an hour. After being packed in lead-lined chests and hermetically sealed, the garden mark, the name of the tea, and the consecutive numbers of the shipment are placed on the cover. The tea is then ready for shipment.

THE INVENTIVE AGE contains sound advice to Inventors and Patentees. For lack of such advice many have lost money. Subscription, one dollar a year.

## Cleaning Air by Washing Instead of Filtering.

It has been demonstrated that much the larger share of trouble caused by imperfect contacts in switchboard connections in telephone exchanges can be prevented by proper ventilation of the operating rooms, and that implies thorough cleansing of the air entering them. Many experiments have been tried in the way of dry-cleaning by filtering through screens of wire and cheese-cloth or cotton-batting, but all such devices require frequent renewal, sometimes at considerable trouble and expense. By continued use any filter of this character must deteriorate and eventually become clogged, and in order to avoid the results of neglect it ought to be practically automatic. This point is essential in an air-cleansing system. In the case of one large telephone company, very satisfactory results have been obtained by passing the air supply through a fine spray of water and afterward precipitating the moisture with the collected impurities and discharging it into the sewer. The water which is taken up at high velocity and held in mechanical suspension, is extracted by centrifugal force by passing it through a series of tubes in which spirals are so placed as to give the air a whirling motion, causing the suspended particles, which are heavier than the air, to be thrown outward and brought in contact with the tubes, from which they flow through perforations to a drip pan below. The washing process imparts about 70 per cent. humidity at a temperature of 70 degrees Fahr. in the operating room. This is considered the most desirable for health and comfort and avoids the excessive dryness sometimes resulting from other systems of heating and ventilating. Moreover, in summer time, with the temperature outside at 80 degrees Fahr. and with the normal temperature of the city water, the air delivered to the rooms can be readily reduced to 70 degrees. This is a supplementary advantage which must appeal at once to sufferers from extreme summer temperatures everywhere, and with the growing knowledge that such an advantage is available will undoubtedly come the insistence that buildings shall be kept cool in one season as well as warm in another.—*Cassier's Magazine.*

# PATENTS

Send Your Business Direct to Washington ∴ ∴  
∴ ∴ Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office is close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-THREE YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

**INVENTIVE AGE**

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

**E. G. SIGGERS,** 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured  
through the Patent Soliciting Office  
of E. G. Siggers, Patent Lawyer,  
Washington, D. C.

Horace F. Neumeyer, Macungie, Pa. This inventor has produced another series of several important inventions, all of which are thoroughly practicable and are now being placed upon the market.

The earliest is a hose nozzle by means of which either a solid stream or a spray can be obtained as desired, the structure being so simple that it can be manufactured at very little cost. A tubular body is employed, having an enlarged end which can be threaded upon the usual hose coupling, this body being also provided with a reduced terminal having an eccentrically disposed opening through its end. Rotatably mounted on the reduced terminal is a sleeve that carries an inclined apron, the margins of which are curved upwardly and overhang the inclined portion. This apron can be moved into and out of alignment with the discharge opening of the head by rotating the sleeve. Thus, when a solid stream is desired, the apron is disposed out of such alignment; but for securing the spray, the apron is placed in the line of the stream, which, being projected against the same, is spread and turned into a broad fan of finely-divided water.

Experiencing considerable difficulty in obtaining the machinery for manufacturing the above nozzle and other inventions, Mr. Neumeyer evolved a novel lathe and has obtained a broad patent thereon. It is well known that in working upon small articles, it is very desirable to have mechanism which will securely and accurately hold the same, while permitting their being placed in and removed from the lathe with the smallest amount of delay possible. This is the feature of the invention. A revoluble tubular shaft is employed that is connected with any suitable driving power. Passing through this shaft is a spindle carrying at one end a series of jaws, which, when the spindle is moved into the shaft, will draw the jaws together and thus clamp upon the work placed therein. The spindle is actuated by a suitable lever having an adjustable connection therewith, and the distance to which the articles may be inserted is limited by an adjustable stop. The shaft can be kept running continuously, but, by operating the lever, the jaws can be thrown into and out of the same, consequently, clutching and unclutching the spindle, and at the same time, clamping and releasing the articles placed therein. The spindle, and therefore the chuck, can be stopped at any time to permit the introduction or removal of the devices operated upon.

The third case is a flushing apparatus of that character which includes a tank or reservoir, from which the water is siphoned, the supply of water to the reservoir being controlled by a float valve. In this instance, the water pipe terminates in a flanged head, suitably clamped to the bottom of the reservoir. In the head operates a vertically moving valve having tapering slots in the walls thereof, these slots permitting the passage of water into the reservoir when the valve is raised, and decreasing the amount of the flow as the valve reaches its full elevation. The valve is made up of a stem, a cap screwed thereon, and an interposed disk washer that engages the end of the water conduit. The float arm is pivoted to ears carried by the flange and has an off-set cam bearing upon the cap of the valve. As the float descends, this cam arm permits the valve to rise which allows the inflow of water; but when it reaches its highest elevation, the

supply is diminished in order to insure the break of the siphon.

The latest invention is along the same lines but relates more particularly to that class wherein the apparatus is operated by the depression of the seat. The valve casing is suitably supported in any desired manner, and has an inlet and outlet to which the water pipes are connected. Another opening located between the inlet and outlet affords access to the operating mechanism of the valves. The valves are carried by a stem extending through the casing, and a rock shaft passing across the stem is located between the intermediate opening and said stem. A connection between this rock shaft and stem is afforded by means of a pin threaded through the shaft and having a free end engaging in a socket in the stem. The rock shaft carries a weighted arm supporting a push-rod that extends to the seat. Suitable means are also employed for regulating the flow of the water and for permitting the emptying of the pipes after use, thereby preventing freezing of the same.

Thomas E. Campbell, Wills Point, Texas. Wrench.—This is a quick action wrench and comprises a shank having a handle at one end and a stationary jaw at the other. A movable jaw is slidably mounted upon the shank and has a chamber. A pair of divergently disposed dogs are pivoted within the chamber, the free ends of these dogs engaging the shank, while an actuating pin for the dogs is slidably mounted upon the movable jaw and extends across the chamber between said dogs. Springs arranged within the chamber bear against the dogs to hold them in engagement with the shank and act in opposition to the movement of the pin.

Joseph T. Crow, Lyons, Ohio. Fence Post.—The post is tubular in form and is preferably constructed of earthenware, such as clay moulded to proper form and burned in a kiln. It has on one side a longitudinally disposed flange, the opposite edges of which are spaced from the walls of the post and constitute seats for the wire fasteners. These fasteners extend diagonally across the wires and have intumed hooked ends that engage between the walls of the post and the edges of the flange.

Seth E. Smith, Atkinson, Nebr. Gage.—The aim of the inventor is to provide a shingling gage which can be applied to ordinary hatchets and by means of which shingles or other articles may be quickly and accurately positioned. A clamp is employed which is adapted to surround the handle of the hatchet and comprises a ring within which is slidably mounted a clamp plate. A screw passing through the overlapped ends of the metal plate forming the ring bears against this clamp plate. An outstanding flange carried by one end of the clamp plate and forming an integral part of the same constitutes a stop, which can be located at any desired distance from the end of the hatchet. In use, the gage is placed against the lower edge of the last line of shingles laid, and the shingle to be positioned is abutted against the hatchet head, afterwards being held until nailed. This does away with the necessity of a chalk line.

Burus M. Thornton and William E. Thornton, Mexia, Texas. Trace Fastener.—This is a very simple and efficient device, and consists of a pair of spaced arms, connected at their inner ends by a transverse pivot bar, which is journaled upon the whiffle-tree, the other ends carrying depending hooks that engage on opposite sides of the end of the whiffle-tree and over the outer face of the trace. The device can be formed of a single piece of wire, and when the trace is secured thereby to the whiffle-tree, there is no chance of its becoming unfastened.

Samuel Nicholls, Sr. Kenesaw, Nebr. Board Setting Instrument.—The object of this invention is to provide a means whereby a flooring, siding or other board may be forced tightly against the board next adjacent and against the beam to which it is to be fastened, until nailed. A pair of crossed levers are employed, the upper ends of which constitute handles, the lower ends forming jaws that embrace the joist or beam and are provided with pins constituting journals. Extending from one side of these levers is a clamping arm that engages the edge of the board, while another arm, located above the same, is forced downwardly by a spring, and has a roller that rests upon the upper face of the board. A holding spur extends from the opposite side of the levers. In use, the levers are clamped upon a beam, and the board to be forced to position is engaged by the arms. After being properly positioned, the device is held by the spur until the board has been nailed.

Martin V. B. Ives, Potsdam, N. Y. Cover for Sap Buckets.—In obtaining sap from maple trees for the manufacture of maple sugar, it is extremely important to provide covers for the buckets employed. These have heretofore not been entirely satisfactory for many reasons. The present device, however, can be manufactured at very small cost, and constitutes a cover which will exclude rain and dirt. The cover is preferably constructed of water-proof paper, circular in form, and having an opening to permit the passage of the spout. Secured to diametrically opposite sides of this cover are wooden blocks arranged against its under face and disposed farther apart than the diameter of the bucket. These blocks fit within the upper edge of the bucket, and thus bow or convex the cover upwardly, so that it will shed the water and at the same time hold itself in place. Metal hooks, fastened to the outside of the blocks, engage over the outer edge of the bucket and serve as additional fasteners.

Frank Kapprel, Atchison, Kansas. Headlight.—The particular feature of this invention relates to the reflector, which is made expansible so that in turning curves the light will be thrown laterally to some extent and thus illuminate the track about the curve. To this end, the reflector is made of hinged sections and means are employed which are controlled by the swaying of the locomotive to swing the sections outwardly and divert the light in the direction desired. After the curve has been turned, the sections again swing together to throw the light directly ahead.

Mark Hagle, Bad Axe, Mich. Ball Caster.—The casing of the caster is preferably formed from a single piece of sheet metal having an upstanding pintle and an outstanding intermediate wall constituting the bearing for a series of balls against which a large ball operates. The wall is strengthened by a doubled flange that prevents the distortion of the casing due to the strain against that portion of the same. The device is exceedingly simple and inexpensive, and at the same time is strong and durable because of the body being so thoroughly supported and braced.

Jacob A. Thomas, Hanover, Pa. Dental Finishing Strip Package.—Dental finishing strips are ordinarily put up loosely in boxes and dentists consequently are subjected to considerable annoyance in selecting and using the same. The present invention is designed to obviate this difficulty and a casing is therefore employed within which is slidably mounted a bunch of the strips, secured together at one end so that they will of necessity move together. When wanted for use, the

bunch is drawn through one end of the casing and as many as wanted are torn therefrom, the head of the bunch constituting the means for securing the same against detachment from the casing.

David H. Sanders, Flint, Michigan. Case.—This case is primarily intended for use in stores for the display of hats or other merchandise. An oblong casing is constructed with an open front in which are pivoted swinging frames carrying glass panels. The frames can be swung into or out of the casing, and when projected therefrom, entirely close the front. Stands are also employed and preferably comprise wire shelves supported by brackets that are hinged to and swing with the frames, the shelves remaining stationary.

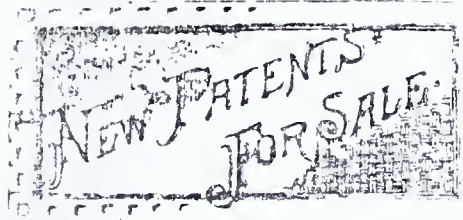
Nathan Johnston, Egan, Texas. Rein Guide.—This is a useful article which has found a ready sale. It consists of an upright frame substantially in the form of the letter H, the cross bar of which constitutes a support for the reins, while the lower ends are suitably fastened to the crupper of the harness. A V-shaped brace has its terminals pivoted to the cross bar and is fastened to the crupper at the front end of the loop. With this device it is impossible for a horse to switch its tail over the reins.

Ernest E. Brott, Burlington, Kansas. Eaves Trough Hanger.—This device is constructed of a single wire and is very much stronger than any heretofore produced. A three-strand cross bar is constructed, this cross bar being provided at its ends with integral loops, one of which is downturned to constitute a stop. The other loop projects longitudinally from the other end of the bar and forms an eye. This latter end is also provided with a depending stop formed by one end of the wire. An integral hanger stem projects from an intermediate portion of the cross bar. A trough-engaging stirrup extends from the end of the cross bar having a downturned loop, the free terminal of the stirrup detachably engaging in the eye.

Liberty Millet, Hagerman, Idaho. Wall Structure.—This invention is capable of use in various ways, as, for instance, in walls of buildings, dams, tunnels and the like. A plurality of standards are employed and facing plates engage against the opposite faces of the standards. These plates are simply secured to the standards and have overlapped edges. Their faces are provided with intersecting grooves through which pass binding wires that secure the same together. After the wires are in place, they may be covered by suitable material which will prevent their corrosion, and at the same time provide a smooth surface to the wall.

William H. Morehouse, Wasco, Ore. Staple.—The staple is made up of a base and three prongs all of which extend in the same direction, two being located at one side of the base and spaced from each other, and the third prong being located on the opposite side of the base and arranged on a line between the spaced prongs. The third or intermediate prong is equal in width to the interval between the two spaced prongs and constitutes in effect a wedge which, when the staple is driven into the wood, forces the material outwardly against the spaced prongs and assures the proper engagement of the same. By this construction the staple can be manufactured from flat sheet metal strips, the material cut from between the spaced prongs on one side constituting the wedging prong of the case adjacent the staple blank.





Advertisements inserted in this column for 25 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 736,455, dated August 13, 1903. Adjustable tool for removing any size screw caps from jars or cans, and for cutting tin lids from cans. Will sell outright. Address, Fred L. Stork, No. 34 Webster Street, Dayton, Ohio. jan

**FOR SALE**—Patent No. 741,894, dated Oct. 20, 1903. Improved copy holder, suitable for any make of typewriter. Address, Durham and Peek, Aurora, Ill. jan

**FOR SALE**—Patent No. 739,715, Eureka Dumping Wagon or Car. Dated September 22, 1903. Address, A. H. Randolph, Corry, Pa. jan

**FOR SALE**—Patent No. 737,739, dated September 1, 1903. Improvement on all other non-refillable bottles. Send for drawing free. Impossible for this bottle to be refilled. Terms cash or royalty. Address, C. Holloway, Lincoln, Ill. jan

**FOR SALE**—Patent No. 735,763, Surveying Instrument. Address, G. W. Holland, First National Bank Building, Brainard, Minn. jan

**FOR SALE**—Stove for laundry and heating rooms, sliding top and two inch pipe, burns charcoal, wood or coke. Can be made at small cost. Simple, but strong. Write, E. C. Leonard, Thompson, Pa. jan

**FOR SALE**—Just issued patent axle for vehicle with changeable points. Old points can be removed and new replaced in a few minutes at small expense. Cash, trade or royalty plan. Address, G. B. McWilliams, Box 395, Olney, Ill. jan

**FOR SALE**—\$600 buys patent on Foldable Camp Stool. Fold 21x21x24 ins. Very strong, compact, easy to manufacture. 3,000 already in use. For details write to Paul R. Anton, 209 E. 2nd street, Topeka, Kans. jan

**FOR SALE or Manufacture on Royalty**—A patent Combined Refrigerator Counter for butchers and domestic use. It requires only half the ice that is required to keep other refrigerators cool. Address, Messrs. Shanklin & Hausam, No. 1822 Agnes Ave., Kansas City, Mo. jan

**FOR SALE**—Manufacturers of Novelties, write for particulars. I have a novelty invention that can be manufactured and sold at not less than six hundred percent profit. Address, C. M. McClune, Galeton, Pa. jan

**FOR SALE**—Patent No. 737,851, issued September 1, 1903. Farmer's Butchering Scaffold. A practical, money making invention of universal need. Offers for state rights considered. Investigation solicited. Address, George M. Landers, Box 20, Terra Haute, Ind. jan

**FOR SALE**—Patent No. 735,885, dated August 11, 1903. I offer for sale an Incubator, non-moisture; has been tried and proven; can furnish testimonials and full proof as to merits of same. Will be pleased to correspond with all interested parties. Address C. E. Kenyon, R. F. D. No. 3, Greenwich, N. Y. jan

**FOR SALE**—Patent No. 722,092, March 3, 1903. Stop Cock for hot or cold water drawn with one handle. \$10,000, or shares stock company. Address, P. R. Feru, Latrobe, Pa. dec

**FOR SALE**—United States patent No. 724,819. Rotary Motor. Combines the wedge, screw and lever advantages in a powerful, economical, and durable compound motor or engine without a dead centre. Address, James M. Crowley, Carl Junction, Mo. dec

**FOR SALE**—Patent No. 729,925, dated June 2, 1903. Farm Gate. Can be manufactured very cheaply. The hanger may be placed on any wood gate, and give it a rolling movement. Price \$600. For drawings and particulars, address, Daniel J. Fuller, Oxford, Indiana dec

**FOR SALE or on royalty**—Patent No. 682,257, November 10, 1902. Device for marking the ears of cattle. It cuts the owner's initials in the ears of the animal. For particulars address, Jacob Hinz, Jr., Canistota, S. D. dec

**FOR SALE**—Patent No. 734,003, Tire Setter and Cooler. Best thing out. Fills a long-felt want. Write to J. B. Preston, Rushville, Ill., for particulars. dec

**FOR SALE**—Patent No. 725,682, dated April 21, 1903. Novel pawl for looms or any place where pawl and ratchet are used. Perfected and in use. Money in it for the right man. Send for cut and testimonials. Address, I. W. Doeg, Newmarket, N. H. dec

**FOR SALE**—Patent No. 719,170, dated Jan. 27, 1903. Folding Camp Chair. Possesses great advantages over other camp chairs. Address, Eli T. Zimmerman, Mansfield, Ohio. apr

**FOR SALE**—Patent No. 715,678, Napkin Holder. Prevents soiling the clothes, is easily adjusted to the body, and not expensive. For further particulars write to L. J. Martin, Orange, Va. dec

**FOR SALE or on royalty**—Patent No. 680,755, dated August 20, 1901. Patent No. 733,454, dated July 14, 1903. Corn Cutter and Crusher. Will crush three bushels of corn a minute with two H. P. Can be manufactured for about one-third selling price. Address, J. S. Bloom, Winthrop, Iowa. dec

**FOR SALE**—Patent No. 532,072. One-half interest in patent funnel and measure, patented January 8, 1895. Will sell cheap. Address, Lafayette Palmer, No. 1724 Penn. Street, Harrisburg, Pa. dec

**FOR SALE**—Patent No. 709,024, dated September 16, 1902. A valuable patent. An illuminated street car sign. Will sell state right, shop right, or on royalty. Also Canada patent for same to sell outright. For further particulars, address John Lorich, Jr. Williamsville, N. Y. nov

**FOR SALE**—Patent No. 735,251, dated August 4, 1903. Bolt Holding Implement. A useful tool for blacksmiths, wagon and carriage repairers; also for farmers for repairing farm machinery. Address, Julian R. Harrison Barnwell, S. C. nov

**FOR SALE**—A recently patented practical fence star, to be used between posts on wire fences. Is light, durable, strong and cheap. Prefer to sell outright. Specifications, drawings and price furnished to interested parties on application. Address, Chas. H. Senour, Dripping Springs, Texas. nov

**FOR SALE**—Patent No. 732,231, dated June 30, 1903. Postless Wire Fence and Telephone combined. This fence consists of endless cable stay. Inventor will warrant same to be durable and reliable. Address, M. H. Starling, Roxbury, Ohio. nov

**FOR SALE**—Patent No. 731,061, dated June 16, 1903. The automatic cattle proof mail box. Approved by Postmaster-General. The best rural box made. Address, C. F. Mackenzie, Shell, Wyo. nov

**FOR SALE**—Patent No. 721,425, dated Feb. 24, 1903. Adjustable support for fire arms, fishing poles, artists umbrellas, etc. Can be made to fit any gun or rod. For particulars, address R. N. Clyde, Shelter Island, N. Y. nov

**FOR SALE**—Patent No. 724,953. Improved Fire Ladder; can be used as a fire escape, a water tower and an extinguisher. No reasonable offer refused. Address, John C. Schaller, Hastings-on-Hudson, N. Y. nov

**FOR SALE**—Patent No. 732,985. Schedule and Train Calculating Machine. United States right \$50,000. Address, J. M. Wilson, Jr., Graysville, Ga. (nov)

**FOR SALE**—Patent No. 733,871, dated July 14, 1903. Necktie. Contains special improvements in sewing and fastening. For price of entire right and plan of manufacture address, Otto Wm. Peterson, Bertrand, Nebr. (nov)

**FOR SALE**—Patent No. 734,350, dated July 21, 1903. Fastening for shoes with new improvement. For sale or on royalty. Address, F. Paschen, Tampa, Fla. nov

**FOR SALE**—Patent No. 730,694, dated June 9, 1903. The most practical washing machine ever produced; the product of forty years experience. I challenge the world on two minute work; grand opportunity for investors. Address, O. E. Peterson, South Glen Falls, N. Y. nov

### WANTED.

**WANTED** to have manufactured, or will sell on royalty plan. Patent No. 733,840, dated July 14, 1903. Heating device (cooking drum), the best thing now in use. Saves time, labor and wood. Nothing so cheap and convenient. Cooks to perfection. Write for particulars. J. W. Howell, 804 East F street, Hillsboro, Texas. (nov)

### NOTICE TO MANUFACTURERS.

I have just had a new Lap-Ring patented; on what terms can I get it manufactured. Answer at once please: Thomas Cotten, Linn, Miss. dec

## ...SILK...

A JOURNAL PUBLISHED MONTHLY.

Devoted exclusively to the Raising of SILK and the Manufacture of the same. Only one dollar (\$1.00) a year.

Subscribe now. It contains information you ought to know.

Address,  
**SILK PUBLISHING COMPANY.**

Tallulah Falls, Georgia.

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever

Issued. The ARMY AND NAVY MAGAZINE, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00

## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America.

For rates, address—

The Railway and Engineering Review,  
1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,  
Send for sample copies. ALLENTOWN, PA.

## SELF-EDUCATION FOR MECHANICS.

A Monthly Journal intended as a Guide to Correct Methods in Work and Study.

25c. A YEAR. SAMPLE COPY FREE

Industrial Publication Co.,  
16 Thomas Street, - - NEW YORK.

**SEND** 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

FRED. B. NICHOLS & CO.,

913 E St., N. W.,

Wholesale Stationers, Washington, D. C.

Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.

THE INVENTIVE AGE PUBLISHING CO., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

## "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O.....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— The Inventive Age Pub. Co.,  
918 F St., N. W. WASHINGTON, D. C.

E. C. WILEY,

Mechanical = = =

= = = Engineer,

Office 811-1-2 Main Street,  
Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.





# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,

WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,

WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON, NOVEMBER, 1903.

### Automatic Fire Kindler.

Among recent unique inventions is an automatic fire kindler, the operation of which is regulated by an ordinary alarm clock. With this contrivance installed in a house, all that is necessary, upon retiring, is to collect the fuel in the stove or fireplace, connect an attachment to the clock, and set the latter at any desired hour. When the alarm sounds, a fulminate is ignited, which, communicating with an inflammable substance in the stove or range, immediately starts the fire. By the time the servant or householder is ready to rise, the fire is burning briskly and the water is boiling.

From the back of the clock used in connection with the automatic fire kindler extends a shaft, on which is mounted a rotary friction disk or pulley, the periphery of which is milled or designed to create friction when rotated in contact with a stationary member. By the operation of a pivotal arm, a lug and spring and other attachments in connection with the rotary disk, this entire external mechanism is set in motion when the alarm is released.

Instantly a fuse, with an easily ignitable fulminate at its end and held in place in a slot opening against the friction wheel, is set afire. The flame, properly confined within the metallic slot, travels over the inflammable strand, which is saturated with a free burning ingredient. The clock may be set on a nearby shelf or on the back of the stove or a furnace projection. As even a small and cheap alarm clock may be utilized, and as the tube-incased fire strand may be safely controlled, that part of the problem is very simple. Moreover, any kind of kindling substance may be utilized. The fuse may be employed merely to ignite paper under the regulation kindling wood fire, with coal or cordwood on top.

### Diseases of Metals.

To romance, rather than to science, belongs a series of experiments that have recently taken place in Germany. These experiments were undertaken to disclose certain characteristics of metals which have heretofore been all unsuspected. It appears to have been demonstrated that metals can be infected with disease, that they may be poisoned, and may suffer structural changes, which have even occasioned the question, are metals alive? Are they inorganic bodies?

Professor Bredig, of Silesia, explains that there are many organic and inorganic substances in which sharp changes of temperature produce changes of structure, or, to use the technical expression, assume new phases under such changed conditions. This alteration of form or structure can be produced suddenly, if the temperature point necessary for alteration is very decidedly over-stepped. But if the temperature does not go far above or below the alteration point, it is necessary generally to introduce an artificial impulse to consummate the change.

For instance, it is possible, under certain circumstances, to cool water to a temperature well below freezing point, and still it will not solidify into ice until a crystal of ice is introduced. Then it begins to form ice crystals at once, and soon is solid.

Pure glycerine cannot be frozen by ordinary means, even if they produce temperatures as low as 20 degrees below zero, until a piece of glycerine that has already been frozen is introduced. But as soon as this crystal is in, the rest of the glycerine, which has been so stubborn, begins to freeze. This process has been termed vaccination, because of the aptness of the term: it now seems that this accidental name held a germ of truth. This process is nothing more nor less than inoculating an inorganic substance with crystals in order to breed in it the condition of crystallization which is the necessary first step toward freezing. In like manner, the conversion of iron to steel is only a series of processes of crystallization.

Recently, a strange thing in metallurgy happened. A ship was loaded with tin in the Straits Settlements and sailed for Europe. When it arrived, and the work of unloading the valuable cargo began, the consignees were amazed to discover that there was nothing left of the entire shipment; it had crumbled to dust. For a long time, no one could solve the mystery. The theory of a flaw or fault in the tin, which would have been advanced in former years, is no longer accepted.

About this time, Professor Bredig brought out some photographs he had made of a church in Silesia. The pictures showed what was left of organ pipes, most of them full of crumbling holes. Whole pipes had entirely vanished. There was no rust, and investigation failed to show any other of the causes that are recognized as destroyers of metals. Scientists confessed themselves nonplussed, until Professor Bredig, who had made a study of the new theories of diseases

of metals, found a wound—a genuine open wound—in a pipe: and his careful and accurate experiments furnished absolute proof that this wound had infected all the pipes with a creeping disease.

His success in this case led to his being called to examine a Council House in another city, the roof of which was crumbling, in spite of the best care and repeated coats of paint. Prof. Bredig soon discovered a center of infection: and he was able not only to trace the gradual progress of the disease over the roof of the Council House, but to show where it had spread to a tin roof near by.

Now, if metals can be infected with disease, it follows that they can be inoculated as organic substances can be. And as science has gradually built a bridge between animal life and plant life, so it would seem possible to find a bridge between the lower phases of plant life and the inorganic or mineral world.

The fact that metals can be treated indefinitely by heat without being destroyed seems, to the mind of the layman, to prove that they can possess the attribute which is called life. But the whole course of plant life depends on temperature and its changes, and temperature affects all animals, including man, even producing illness and death when the changes are sudden. In other words, as gradual and normal changes of temperature affect animal and plant life normally, so they do metals; and abrupt and abnormal changes of temperature change the structural form of each.

Studies of the changes in iron under all grades of temperature appear to show that the metal passes through various stages of disease that produce structural changes, just as cells change in form, size and position in the forms commonly called organic. A German professor heated copper in order to find why that metal suffers from over-heating, and his conclusion is that it becomes poisoned with copper protoxide, which so sickens it that its structure changes and partially breaks down.

### Photography at a Distance.

Many attempts have been made to take photography at a distance of several miles. With the employment of the camera in connection with astronomy, as everyone is acquainted, the instruments employed are heavy and expensive. A new invention, called the "telephot" seems to be practical, and at the same time to dispense with the weight and expense. A Swiss naturalist has a device which he uses in connection with a telescope, the eyeglass of which is removed so that the image is formed at the focus of the objective. Plane mirrors are used between the objective and the plate. The total length of the apparatus is only about 4 inches, and it is likely to be very useful for scientific purposes, as well as in warfare. It will be possible to photograph any phenomenon visible at the extreme horizon, such as mirages, etc., as well as those that cannot be approached in safety, such as volcanic eruptions. Wild animals can also be

observed and photographed at a distance. The amateur astronomer can take fine views of the heavens. The explorer of the Arctic regions will examine, by means of this new apparatus, distant and inaccessible points. Military and naval officers will be able to observe and study the movements of the enemy; in fact, the apparatus may be used as a telescope as well. The telephot is also well adapted to the taking of topographical measurements.

### Making Gold From Silver.

The electric theory of matter has received a strong impetus at the hands of Lodge, Thomson, Crookes and others, especially since the discovery of the radio-active substances, thorium, radium, etc. This theory assumes that the material atom is made up of a large number of so-called electrons, the number depending on the density of the substance. Thus, for instance, it is assumed that the atom of hydrogen is made up of about 700 electrons, the mercury atom of about 140,000 electrons, the gold atom of about 137,200, etc. The different known elements, therefore, are made of different groupings of electrons. The theory further assumes that these electrons are in stable orbital rotation around one another, the whole being held together by mutual attraction, their orbits being as large relative to the size of the electrons as the orbits of the planets of the solar system. With such a theory as this, it was to be expected that modern alchemists would promptly seize the opportunity of bringing about a rearrangement of the electrons so as to produce from one element a more valuable one. This expectation has been realized in the person of a Philadelphia inventor or experimentalist who claims to have already brought about a transmutation of silver into gold. He selects silver for the transmutation because of the approximate similarity of these two elements chemically considered. The process by which the transmutation is accomplished is chemical and electrical, of course. The inventor admits that the elementary forces of nature in combination and decomposition are well-nigh irresistible, and, therefore, to transform one atom into another it is necessary to destroy the inductual capacity of the electrons by bringing them to a condition of temporary inactivity or torpor. The electrons can then be segregated, he claims, and forced out of their previous correlation, and then be reassembled in any desired grouping. The inventor has no difficulty in showing prospective investors in the stock of the company which will doubtless be organized that the net profits in transforming one million ounces of silver into a similar amount of gold will be over sixteen millions of dollars, the cost of transformation being only 17 per cent. of the value of the product. This scheme, it will be seen, is quite as reasonable as, and far outstrips the Keeley motor enterprise in calculable profits, the home of which, by the way, was also in Philadelphia.—*Cassier's Magazine*.



## SCIENTIFIC



## PROGRESS.

## New Process for Metal Welding.

A Prussian, Mr. Hans Goldschmidt, residing at Essonthe-Ruhr, Germany, has assigned to Mr. Clarence B. Schultz, of Berlin, Prussia, Germany, a patent obtained in this country on a process of metal welding.

The invention relates to a process for welding metal pieces by casting molten metal around the ends to be welded. In the processes hitherto used, it was always a great disadvantage that the metal cast around the ends to be welded joined with the metal pieces. This disadvantage is done away with by the present invention, which consists in first coating the parts to be joined with molten alumina or the like slag. By this coating the molten metal is prevented from coming in contact with, and adhering to, the parts to be welded.

## A New Storage Battery.

An English electrical engineer, Mr. Job T. Niblett, of Greenwich, London, England, has patented in this country a new storage battery. It has reference more particularly to the employment in such batteries of the material known as "kieselguhr" or "infusorial" earth, the highly absorbent nature of which, as well as its power of resisting the action of acids, is well known. The invention is designed to improve both the active material or coating of the plates and also the porous or absorbent separators, blocks, or plates which are commonly interposed between the electrodes. This is accomplished by incorporating with such active materials, and also with the materials from which the said separators or blocks are made, a certain proportion of infusorial earth, whereby great porosity both in the active material and the separators is attained, and hence the improved cells are capable of very high rates of charge and discharge, while they can, if desired, be made practically into what are known as "dry" or "afluidic" cells.

## Electric Heater for Cars.

The Westinghouse Air Brake Company, of Pittsburg, Pa., has purchased a patent from Mr. Edwin M. Herr, on an Electric Heater for Cars.

The invention relates especially to that class of heaters which also serve as resistance devices or rheostats for the controller of electric cars to regulate the current supplied to the motors or to regulate the current generated in a local brake-circuit; and it has for its object to provide means whereby the heater may be located in a position to warm the interior of the car during cold weather, as in winter, and may be moved to another position where its heat does not effect the interior of the car during warm weather, as in summer.

Heretofore two resistance devices have been employed for this purpose—a rheostat located outside of the car and an electric heater located within

the car—with a switch for connecting either the outside rheostat or the inside heater into the circuit for controlling the starting and stopping of the car. This necessitates a double equipment and connections, which is very expensive, while by the use of the present invention the electric heater may be used as the controller-resistance device at all times, and the outside rheostat and its connections may be dispensed with altogether.

This invention therefore consists in a movable electric heater which may constitute the resistance device or rheostat for the controller of an electric car and is adapted to be moved from one position where its heating effect is utilized to warm the interior of the car, to another position where its heat does not effect the temperature of the interior of the car.

## New Device for Illuminating Elevators.

Mr. George Hail, of Providence, R. I., has devised a threshold-illuminating device for elevators, his idea being that, as many accidents are caused by persons attempting to leave or enter an elevator car when the latter is stopped with its floor out of level with the adjacent landing, an illuminated threshold will call the attention of the passenger to any inaccuracies of this kind. The invention is, therefore, believed to be particularly advantageous where the car and the well are not satisfactorily lighted, so that the passenger is unable to appreciate the difference in level. Several different forms of the invention are proposed by the patentee. In one, he employs an electric circuit extending from the top to the bottom of the elevator shaft and having branches therein that are located at the different landings. These branch circuits include an electric lamp, so arranged that it will throw light directly upon the landing. A switch is also included in each branch circuit and is normally held open by the elevator door when closed. As soon as the elevator door is opened, however, by the conductor of the elevator, this switch will close; thus closing the circuit through the lamp and causing the same to illuminate the landing. In another form of invention a lamp is carried by the elevator and is automatically illuminated as the car reaches the different floors.

## Molder's Sponge.

A novel molder's sponge has been patented by Mr. Albert G. Schmidt, of Springfield, Ohio.

It is well known that molders require in their work a small sponge which is preferably conical in form or of such shape that it terminates in a point. The natural supply of sponges adapted for the purpose is so limited that they do not meet the demand, and therefore command a high price. Mr. Schmidt, however, proposes to construct a device of this character by forming a porous envelope of netting making the same cone-shape and forming it with small pieces of sponge or other suitable material. Thus, the desired shape can be cheaply obtained with all its advantages.

## Frosting Glass.

A new method of frosting glass bulbs or globes has been devised by Mr. Patrick Kennedy, of New York City, who has assigned his entire interest to the Consolidated Railway Electric Lighting and Equipment Company.

The object and purpose of the present invention is to produce on the inner surface of the bulb a frosted appearance, which may cover the whole of the said inner surface or only a part thereof. To effect this object the upright bulb is charged through its lower tubular stem with an etching or corroding acid—as hydrofluoric acid, for example—by pressure on the body of said acid, and after it shall have produced the desired effect by corroding or etching the inner surface of the hollow bulb the acid is allowed to flow out by gravity, the pressure being balanced or removed. In order to cleanse the bulb thoroughly of the acid, the above operation is repeated with water, which rinses out the bulb. This result may be effected by immersing the lower stems or necks of the bulbs in the acid or liquid in a closed receptacle and putting air pressure on the liquid, so as to cause it to rise in the bulbs to the desired extent, or it may be done by using an open liquid receptacle and exhausting the air from the bulbs at their upper stems. In this case the pressure on the liquid acid or water will not exceed that of the atmosphere.

## Wireless Telegraphy.

An English electrician, Mr. Sidney G. Brown, of Bournemouth, England, has patented in this country an improvement in a system of Wireless Telegraphy.

The transmitter apparatus is provided with two radiating wires, coupled one to each terminal of the sparking device, and the receiving apparatus is provided with two receiving wires coupled one to each terminal of the coherer. These radiating and receiving wires are respectively placed at a distance apart which has a definite relation to the length of the signaling-waves, that of half a wave length or approximately half a wave length being the most convenient distance. This placing of the wires half a wave length apart causes the system to send its waves or to receive them from mainly one direction, which direction would seem to be that of the plane of the wires. If the vertical wires were not so carefully adjusted to the wave length, they would transmit or receive the Hertzian waves from any direction. By arranging a condenser across the high-potential terminals of the spark-coil, and joining the terminals of this condenser to the spark-balls through highly inductive coils, the persistence of the waves can be increased, the conductor acting as a storage of power and maintaining the condenser at each side of the spark-gap. The highly-inductive coils prevent the charge in the condenser from itself oscillating across the spark-gap. By thus increasing the persistence of the train of Hertzian waves due to each disruptive discharge, the receiving-circuit can be caused to be in tune or sympathy with the transmitting-circuit, thus rendering the system more sensitive and less likely to be interfered with by neighboring systems differently disposed.

## Concrete Block Buildings.

Dwelling houses and factory buildings with concrete walls, in which the concrete has been moulded in place in large masses, have become comparatively common; but in recent years a species of hollow concrete block construction has been introduced, which, in some respects, appears to promise even greater advantages. Such hollow concrete block houses are, in a measure, highly developed examples of the remarkably durable adobe houses of Mexico and the Southwest of the United States, which, though built simply of large sun-dried blocks of clay, appear as though hewn out of one solid mass, and have been found to successfully resist both great heat and heavy tropical rains. Walls built of hollow concrete blocks, with their enclosed air spaces, tend to keep houses warm in winter and cool in summer, and the only problem of satisfactorily building them has been that of cost. This, however, we are told, has now been solved by a machine which turns them out quickly and cheaply and in all desired sizes. The moulds are made with removable sides, and after the block of concrete has been formed, these sides are swung out of the way and the block can be lifted out and left to thoroughly set. Grooves and tongues can easily be formed in the blocks, enabling them to be rigidly tied together in building up a wall, and openings can also be provided in them to receive the ends of floor beams, the joints being subsequently filled with cement, if desired, to insure greater security. Many houses have of late been built with such blocks, and their popularity seems to be on the increase. In appearance such concrete block walls resemble masonry; in fact, the blocks can be fashioned after almost any desired pattern—*Cassier's Magazine*.

## Petroleum Briquettes.

A very simple process has just been conceived by a Mr. Maestracci for making petroleum briquettes, very much resembling those made of coal. The *modus operandi* is as follows: To a liter of petroleum are added 150 grams of soft soap, 150 grams of resin, and 300 grams of caustic soda lye wash. This mixture is heated and well shaken. As soon as the mass begins to solidify, which should be in about forty minutes, the progress of the operation should be very carefully watched. To prevent the mixture running over, a little soda should be poured into the vessel, shaking the whole until solidification is complete. When the operation is finished the matter is run into molds to be made into briquettes, which are then placed in a stove for ten or fifteen minutes. It then only remains to allow them to get cold, when they can be used within an hour or two of being manufactured. By the addition of sawdust and sand, the briquettes will be more solid and at the same time cheaper. From experiments, said to have been conducted on tugs, the inventor claims it has been clearly shown that these briquettes give three times more heat than ordinary coal, there being, in addition, the advantage of no waste remaining.



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued September 22, 1903.

### MECHANICAL PATENTS.

Continued from October Number.

Engraving machine tool holder. A. E. Francis  
Envelope. C. C. Peterson  
Envelope. J. H. Nelson  
Exhibiting box. M. E. Francisco et al  
Extensible case. E. G. Schrieffer  
Eyeglass nose guard. J. C. Nourie  
Farrier's rasp. G. K. Woods  
Fastener. W. Wallentin  
Fastener or clasp. J. B. Harris  
Feed water heater. P. J. Snowden  
Feed water heater and purifier. J. W. Pertz  
Fence fabric. Wire. J. L. Claudin  
Fence fabric. Woven wire. J. L. Claudin  
Fence machine. W. W. Thompson  
Fence machine. Woven wire. G. Jaeger  
Fiber drawing apparatus. W. Thompson et al  
File. Bill. W. H. Detwiler  
File. Book. C. C. Mumm et al  
File. Paper. P. Meizer  
Filing case. W. A. McFarland  
Filter. 2 pats. F. E. Bachman  
Filter. Liquid. 2 pats. O. Seig et al  
Fire extinguishing apparatus. W. D. Link  
Fire plug. Antifreezing. J. F. Kehr  
Firearm. C. Hamilton  
Fish net float. J. Koenig  
Fishing rod reel. W. J. Harris et al  
Flame producing device. A. O. Kaplan  
Flue cleaner. A. M. Melcher  
Fluid motor. W. E. Ewald  
Form. Sleeve. M. F. Rocheleau  
Frame or ring. H. J. Garsman  
Fruit dipper. H. M. Barngrover  
Fuel feeding apparatus. Fluid. M. D. Compton  
Furnace draft regulating apparatus. A. Klein  
Game apparatus. W. L. Newman  
Game board. 2 pats. E. T. Burrows  
Game. Instructive. E. H. Ives  
Garment supporting corset attachment. J. Jonas  
Gas burner. J. H. Rath  
Gas burner. W. C. Bucknam  
Gas burner regulating valve. V. A. Rettich  
Gas generator. Acetylene. C. M. Kemp  
Gas generator. Acetylene. F. M. Caler  
Gas plant. H. Gerdes  
Gas producer. A. M. Gow  
Gas producing system. G. Westinghouse  
Gearing. Variable speed. C. H. Heath  
Gem setting. F. R. Stafford  
Glass articles. Drawing. J. H. Lubbbers  
Glass molding machine. F. H. Gibson  
Glass tiles. Manufacture of. W. T. Nicholls  
Glove. R. L. Thompson  
Glove or garment fasteners. Stud member of. J. V. Washburne  
Gold and silver. Treating refractory complex ores. C. E. Baker et al  
Golf club. W. J. Travis  
Grain separator. W. M. Russell  
Grate. C. C. Sanders  
Grate. Hollow blast. S. P. Grey  
Grater. Nutmeg. A. H. Hill  
Grease feeder. C. T. Prehn  
Greenhouse construction. F. Rinker  
Grinding mill. H. C. Groves  
Gun. Automatic. C. A. T. Sjogren  
Hammer drop movement. Trip. D. Melcher  
Hand hole plate. L. Rauhauer  
Harmonium. C. Hesse  
Harp. J. E. Childs  
Harrow. M. McDonald  
Harvester. E. A. Maingnet  
Harvester platform. W. E. Mann  
Harvester reel. W. E. Mann  
Hat forming machine. J. Marshall  
Heater attachment. E. Burger  
Heating apparatus. J. N. Murphy  
Hinge pin. J. C. Griffin  
Hoisting bucket. A. C. S. Rue  
Hook and eye. W. H. Scott  
Hoop fastening. R. R. Staunard  
Horse releaser. W. H. Mack  
Horse weight suspension device. J. Diehl  
Horseshoe. G. E. Watson  
Hose supporter. V. Ginzburg  
Hose supporter. F. C. McDonald  
Ice cutting machine. F. J. & A. H. Reinhold  
Ink well. Self-closing. J. B. Calvert  
Insect trap. M. Leveson  
Insulated twin joint. G. A. Weber  
Insulating and waterproofing various articles. Composition for. E. A. G. Street  
Joint cover or kick plate. C. C. Bohn  
Journal box. J. M. Wann  
Journal box lid. 3 pats. T. H. Symington  
King post. Spring. J. N. Kailor  
Kneading and forming machine. Dough. W. Steinbrecher  
Knife. A. S. Allen  
Knitting machine. E. Parkinson  
Ladder. Combined step and extension. E. L. Harmon  
Lamp. Hydrocarbon street. C. Perillat  
Lamp. Incandescent gas. R. W. Huss  
Lamp. Incandescent hydrocarbon. C. Perillat  
Land roller and corrugator. Combined. E. H. Grubb  
Launch storm hood and cover. A. H. Castle  
Leather. Tumbling drum for. W. A. McManus  
Lifting jack. E. M. Robinson  
Lifting jack. G. B. Davison  
Link for shirt cuffs or the like. J. Tritsch  
Lithotype machine. J. L. Crane  
Liquid containing vessel indicator. M. Wood  
Liquid cooling apparatus. H. Flugge  
Lock. G. T. Oplinger  
Loom. R. Crompton  
Loom picker motion. A. H. Whatley  
Loom web replenishing and controlling mechanism. W. H. Baker et al  
Magnetic separation apparatus. B. H. Sweet  
Mail case for rural delivery. J. A. Utterback

Mangle. C. F. Klein et al  
Material elevator. H. Cull  
Mattress stretcher. Wire. J. B. Wilson  
Measure case. Tape. L. S. Starratt  
Measure. Liquid. J. T. Flaberty  
Measuring and bag filling apparatus. A. J. Johnston  
Mechanical movement. C. A. Carlson  
Melting furnace. J. B. Orison  
Mercerizing apparatus. R. Boral et al  
Metal working by electricity. D. E. Johnson  
Metallic tie and rail fastener. A. J. Klinkner  
Milk pasteurizer and cooler. C. R. Swisher  
Mine tippie. G. W. Parker  
Mining machine. Coal. G. Muschweck et al  
Mop. F. R. Lay  
Mop wringer. R. R. Pearson  
Motion transmitting device. G. G. Bertzel  
Motor control system. A. H. Armstrong  
Motor control system. C. E. Barry et al  
Necktie shield and fastener. F. Lambioui  
Nutmegging machine. F. W. Wicht et al  
Nut lock. G. P. Finnigan  
Nut lock. M. Reid  
Oar. Bow facing. J. P. Fretwell et al  
Oil burner. W. F. Hogan  
Oil burner. Self cleaning. P. K. Morcom et al  
Oil cake forming apparatus. E. C. Bisbee  
Oil cake stripping machine. E. C. Bisbee  
Oiler. Gun barrel. J. C. Dalrymple  
Oiling device. Automatic. G. W. Thurston  
Ore roasting furnace. C. A. Fontaine  
Overseaming machine. C. G. Kramer  
Oxygen generating apparatus. Portable. A. Rosenberg  
Packing joint. P. C. Traver  
Packing. Piston. E. F. F. Roberts  
Paper box machine. J. S. Woodbridge  
Paper corrugating machine. W. L. Allen  
Paper making machine. Carbon. F. B. How  
Paper reeling machine. B. F. Perkins et al  
Papering machine. Wall. S. R. Crockett, Sr  
Pawl and ratchet connection. D. K. Bryson  
Pen for recording instruments. F. A. Jones  
Pen. Fountain. J. G. Rider  
Pen. Stock. L. Reingardt  
Photographic printing machine. C. J. Everett  
Physicians' tables. Tray support and closet for. W. D. Allison  
Piano electric attachment. G. H. Davis  
Piano plate. W. Bieger  
Pigment and producing it. A. S. Ramage  
Pin retainer. C. F. Whitnigh  
Pin securing device. A. Rainess  
Pipe coupling. W. R. Park  
Pipe wrench. D. H. Irland  
Planter. J. P. Byrne  
Playing ball. E. Kempshall  
Plow. Bedding. S. D. Poole  
Plow rear wheel controller. Disk. C. J. Simeral et al  
Plumber's testing plug. T. G. Clifford  
Pocket book. M. Lovece  
Portable engine for removing bark from standing trees, &c. W. P. Kidder  
Potato digger. J. E. Egan  
Pouch or bag holder. W. C. Harder  
Power mechanism. B. J. Arnold  
Primers and cartridges. Packing strip for. R. Gair  
Printing or other machines. Edge unfold for fabric. H. E. Green  
Prints may be taken. Treating and producing metal surfaces from which. P. Ny  
Pulley structure. Cone. H. P. White et al  
Pump attachment. F. Dobson  
Pump attachment. G. H. Davenport  
Pump. Deep well propeller. J. M. Tillotson  
Racket for playing lawn tennis. & C. A. Schuek  
Rail fastening. 2 pats. G. A. Weber  
Rail joint. G. A. Weber  
Railway block signaling system. H. B. Taylor  
Railway brake. Fluid pressure. J. F. Voorhees  
Railway cattle guard. W. von Daake  
Railway. Pleasure. G. F. Myers  
Railway rail joint. 3 pats. G. A. Weber  
Railway rail joint. L. Dinger, Jr  
Railway signal. R. F. Johnson  
Railway stop. Automatic. Z. L. Trainham et al  
Railway switch. Street. W. Doll et al  
Railway switch. Street. G. W. Thompson  
Railway tie. Metallic. D. N. Avey et al  
Railway track. W. Goldie  
Range finder or telemeter. A. Barr et al  
Razor stop. W. H. Doss  
Rein support. J. F. Penrod  
Road spool. W. H. Corbett  
Rock drilling system. J. G. Leyner  
Rod coupling. T. W. Kenworthy  
Rolling machine. Tube. J. P. Kane  
Rolling mill. W. B. Hughes  
Rolling mill. G. Hargreaves  
Rope fastener. R. W. Cox  
Rotary engine. J. H. Cadoo et al  
Rotary engine. G. White  
Roundabout. O. Manig  
Running gear. M. G. Bunnell  
Saccharine or other solutions. Clarifying. E. M. Deming  
Sanding device. Automatic. W. F. Cady  
Sash fastener. G. & J. Goerk  
Saw. S. Toles  
Saw. W. E. Tilden  
Saw. Drag. W. P. Kidder  
Scaff retainer. R. L. Gooding  
Scissors or shears buttonhole cutting attachment. M. H. Bolsinger  
Scraper. Cotton. B. F. Williams  
Scraper. Road. M. G. Bunnell  
Screw driver. S. P. Kenn  
Seal lock. D. E. McLaughlin  
Search light projector. J. L. Hall  
Sewing machine cabinet. S. H. Wheeler  
Show case or show front. J. L. Crane  
Sign. Advertising. J. S. Anderson  
Signal system. Pneumatic. H. T. Farnsworth  
Siphon. C. H. Gilby  
Sizing and producing same. A. A. Dunham  
Smoke consumer. H. R. Ellsworth  
Snap hook. T. Forstner  
Snow plow. J. E. Cailley  
Snow plow coupling device. J. W. Russell  
Sodium peroxid. Producing. C. E. Baker et al

Soldering iron. Self heating. F. E. Renick  
Sorting machine. H. Speiser  
Sound record. E. R. Johnson  
Sound record cylinders. Metal matrix for forming duplicate. A. N. Petit  
Sower. Seed. W. H. Bohr  
Spinning ring. M. E. Sullivan  
Stanchion. W. Kueter  
Starching machine. G. C. Roberts et al  
Steam boiler. L. C. Auldjo  
Steam engine. L. Hicks  
Steam generator. L. Rauhauer  
Steam separator. C. M. Friesland  
Steam trap. J. G. Morgan et al  
Steam trap. Thermostatic. C. H. Atkins  
Stencil duplicating apparatus. A. D. Klaber  
Stencil sheets to duplicating machines. Means for attaching. A. D. Klaber  
Step joint. G. A. Weber  
Stereoscope. Automatic. T. B. Eastman  
Stiffening cord or tape. E. K. Warren  
Stiffening material. Machine for manufacturing. E. K. Warren  
Still for petroleum oil or hydrocarbon fluids. W. Ryder et al  
Stopper fastener. E. W. Klingensmith  
Storing and unloading materials. Apparatus for. C. C. Vermeer  
Stove. P. Hamer  
Stove burner cup. Oil. J. S. Frey  
Stove. Gas. O. H. Ernst  
Stovepipe. F. E. Heinig  
Stove. Radiant. E. Scott  
Stud. T. R. Hyde, Jr  
Subtarget. H. H. Cummings  
Sugar juice. Apparatus for the continuous carbonation of alkaline. L. Naudet  
Sunshade. E. Reger  
Sweep mill. C. W. Baird  
Switch bar attachment. C. Partington  
Switch operating device. E. L. Pence  
Switch operating mechanism. Z. L. Trainham et al  
Table. Extension. W. A. Finkbeiner  
Talking machine needle feeding device. E. D. Gleason  
Talking machine sound record. E. R. Johnson  
Target practice apparatus. H. H. Cummings  
Telegraph poles or the like. Step for. S. S. Leonard  
Telegraphy. Wireless. E. E. Butcher  
Telephone switchboard. G. F. Archer  
Tension device. W. S. Wells  
Thill coupling. W. S. Marshall  
Thill coupling. J. N. Keach  
Thread dressing machines. Tension regulating device for. G. A. Fredenburgh  
Threshing machines. Means for propelling and guiding. P. S. Houghton  
Ticket marking device. Pin. A. W. A. Finch  
Tide motor. A. W. Fredson  
Tie plate. A. F. Wood  
Tiles. Paving. A. Picha  
Tobacco hoist. J. Sullivan  
Tongs. Scorifier. J. M. Hyde  
Tool chest. F. J. Schwartz  
Tool holder. E. A. Warburton  
Tool. Impact. S. Oldham  
Tool. Pneumatic. 2 pats. H. G. Kotten  
Toy. Detonating. C. E. Wenzel  
Toy house. Knockdown. G. E. Grimm  
Toy spring gun. Top spinning. S. E. Purdum  
Trace carrier. A. B. Meinhardt  
Transom lock. O. A. Essig  
Trap door lifter. F. Fountain  
Traveling case. F. H. White  
Tree support. A. A. Hoyt  
Trolley catcher and replacer. J. V. Ainsworth  
Trombone. Slide. F. P. Shepard et al  
Truck. Car. 4 pats. W. S. Adams  
Truck. Car. J. A. Brill et al  
Truck. Maximum traction. C. F. Uebelacker  
Trunk. H. Davis  
Tufting machine. Fabric. J. T. Roberts  
Tug attachment. B. I. H. Mitchell  
Type writer carriage feed mechanism. E. S. Shimer  
Type writer heading holder attachment. J. G. Ambrose  
Type writing machine. W. J. Barron et al  
Type writing machine. B. C. Stickney  
Type writing machine. G. F. Stillman  
Type writing machine. C. W. Walker  
Umbrella drip receiver. R. S. Johnson  
Umbrella. Folding. W. L. McComb  
Universal joint. F. E. Bocorselski  
Valve. S. H. Moore  
Valve bushing. J. A. McMillen  
Valve mechanism. Steam engine. C. Schmid  
Valve. Rotary engine cut off. S. S. Whitaker  
Vapor generator regulator. E. Thomson  
Vehicle. S. W. Rowell  
Vehicle blanket holding attachment. J. Burton  
Vehicle body corner iron. G. E. Elsey  
Vehicle driving mechanism. Motor. F. Kupper et al  
Vehicle. Road. A. Beurrier  
Vehicle steering apparatus. Motor. A. Janssens  
Vehicle wheel. G. B. Dryden  
Vending apparatus. 2 pats. J. B. Hurd  
Veneer cutting machine. C. R. Traxler  
Ventilating and cooling apparatus. J. H. McConnell  
Veterinary forceps. W. B. Stevens  
Violin bow. M. E. Verdier  
Vision testing apparatus. R. K. Grove  
Vulcanizer. Time controlled. W. H. Becroft  
Wagon brake. W. A. Williams  
Wagon. Dumping. A. J. Koob  
Wagon. Dumping. A. H. Randolph  
Wagon stake standard. J. H. Gressom  
Wall or ceiling. Sectional. J. A. Carter  
Wall register. P. S. Stauffer  
Water gate. J. H. Martin et al  
Water purifying apparatus. A. Sarge, Jr  
Wedge grip. W. E. Spencer  
Wells and for collecting oil therefrom. Device for extinguishing burning oil. F. N. Bell  
Wheel stand. G. H. Pfeil  
Whip. A. J. Schmidt  
Whip stand. Portable and revolving. C. J. Abbe

Wind or water wheel. J. Handel  
Windmill. J. M. Crow  
Winding machine. S. W. Wardwell  
Window. O. M. Edwards  
Window. 2 pats. F. H. Lunken  
Window screen. F. A. Mansell  
Window screen. J. M. Elmendorf  
Wire. Envelop for coiled. H. C. Boyle et al  
Wire fabric to frames. Device for securing. S. W. Peregrine  
Wire reeling tool. J. G. Eberle, Jr  
Wire screen cloth to doors. Machine for applying. S. W. Peregrine  
Wire working tool. C. Stoolfire  
Wrench. A. B. Green  
Yoke fastener. Neck. A. L. Reinke

### DESIGNS.

Card mount. 2 pats. H. H. Collins, Jr  
Doll. C. E. Schultze  
Pianos. Casing for players for. 2 pats. C. L. Emmons  
Spoon or similar article. C. B. Shepard  
Spoons, forks, or similar articles. Handle for. J. E. Straker, Jr

Issued September 29, 1903.

### MECHANICAL PATENTS.

Advertising novelty. J. L. Kellogg  
Air brake attachment. F. R. O'Bannon et al  
Air brake attachment. Locomotive. H. R. Nevens  
Air brake systems. Compressor for. W. K. M. Hildebrand  
Air heating and moistening apparatus. I. S. McDougall  
Alumina and by-products. Making. L. R. Keogh  
Amusement device. Coin controlled. R. H. Hartley  
Animal trap. M. F. Werner  
Arches. Device for use in constructing. T. R. Spencer  
Article attacher. E. B. Carpenter  
Autographic duplicate recorder. W. W. Eaton  
Automobile pump mechanism. R. H. White  
Automobile steering mechanism. R. H. White  
Axle box. Car. E. Deuere  
Axle skein. H. M. Cryer  
Bag fastener. W. Parks  
Balance escapements. Double roller for. F. J. Reaves  
Barrel. S. J. McGaughy et al  
Bass viol. Trick. G. H. Butzbach  
Bearing. Antifriction. G. N. Toms  
Bearing. Disk. C. F. Wilkins et al  
Bed and table. Combination. J. F. Cook  
Bed brace. E. L. Cruzan  
Belt. Apparel. B. B. McCulloch  
Bicycle. A. Mendenhall  
Billard and pool table. Convertible. H. L. Haskell  
Binding strip cutting and forming machine. L. Delivouk et al  
Blow testing machine. M. B. Mills  
Bobbin rougher. N. H. Shaw  
Boiler. J. McWilliams  
Bolster and truck. S. Otis  
Bolster. Body. S. Otis  
Book holder. Account. A. J. Shaul  
Book sheets. Reinforcement for. W. M. Byrne  
Boot or shoe inner sole. W. H. Adams  
Borax rubbing machine. A. La Francis et al  
Bottle. Non-refillable. H. Koorie  
Bottle, &c. Non-refillable. P. B. Jagger  
Bottle washing, filling, and corking machine. F. L. Seely  
Boquet holder. D. Rait, Jr  
Box. W. W. W. Green  
Box setting up machine. Dovetail. J. E. Erickson  
Brakes. Inertia governor for fluid pressure. R. A. Parke  
Brauner feeder. Automatic. A. J. Maskrey  
Brauner feeder mechanism. A. J. Maskrey  
Brick machine. C. W. Kilborn  
Brick mold. Cement. S. M. Kimble  
Bricks. Manufacture of. M. Perkiewicz  
Buckle. W. Freeman  
Building material. Manufacture of artificial. A. Seigle  
Building or roofing block or material. S. C. Davidson  
Bung pulling implement. E. N. Greenwood  
Bung, stopper, or the like for casks, &c. J. Ross et al  
Burner. A. H. Humphrey  
Button attaching or other machines. Automatic feed for. H. M. Radcliffe  
Button keeper ring. A. H. Bryant  
Button setting machine. E. B. Stimpson  
Button working machine. H. Chalmers  
Cabinet. Document. R. K. Davis  
Cabinet. Store. H. H. Flanagan  
Cable hanger. J. J. Smith  
Camera shutter. F. V. & K. E. Conley  
Can head fastening machine. C. Stecher  
Can heading machine. J. A. Gray  
Car. Bottom dumping. S. Otis  
Car brake beams. Brake head for railway. S. A. Crone  
Car bumper. Railway. E. M. Smith  
Car coupling. W. N. Hensley  
Car draft and buffing gear. I. O. Wright et al  
Car draft rigging. Railway. S. Otis  
Car. Dump. H. S. Hart  
Car. Dump. H. S. Hart et al  
Car. Dump. 3 pats. G. B. Maltby  
Car. Dump. S. Otis  
Car. Dump. S. Otis et al  
Car. Dumping. R. Jonas  
Car fender. J. Haskins  
Car. Freight. H. R. Keithley  
Car icing system. J. A. Werner  
Car loader. S. K. Smith  
Car. Motor. R. H. Hassler  
Cars. System of underframing for railway. G. W. Scott  
Card. E. B. Carpenter







Well jack. Oil..... J. Barrett  
Wheel box .. 2 pats..... L. E. Watermann  
Wheel nave cap..... F. Charron et al  
Wheelbarrow..... C. A. Baker  
Winding machine. Ball..... G. C. Worthington  
Windmill..... A. W. Thompson  
Windmill regulating attachment..... S. Brice  
Window..... A. Weingaertner  
Window attachment..... W. S. Hill  
Window. Pivoted..... E. Hipolito  
Window putty protector..... M. F. Stadtmuller  
Window screen. Roller..... J. S. McNamara  
Wire bending machine..... C. H. Coombs  
Wire grip..... H. D. Hazard  
Wire handling device..... D. H. Steel  
Wire machine. Barb..... N. J. Billstrom  
Work box..... L. R. Lane  
Wrench..... J. E. Melcher  
Wrench..... E. F. Davis  
Zinc from sulfid ores, &c. Extracting C. Rogers

Issued October 6, 1903.

#### MECHANICAL PATENTS.

Acid. Alkyloxyalkyliden esters of salicylic..... J. Callisen  
Adding and subtracting integers and fractions. Machine for..... B. Bundy  
Advertising book..... J. H. Asbury  
Agricultural implement..... J. Dowling  
Air compressors. Air conduit for hydraulic..... W. O. Webber  
Ammunition distributing apparatus..... W. C. Manning  
Amusement device..... C. A. Needham  
Anger..... W. M. Potter  
Anger blank die..... I. W. Smith  
Automobile..... F. M. Leavitt  
Automobile body..... J. H. MacAlman  
Automobile transmission gear..... A. M. Jenkins  
Awning .. 2 pats..... T. H. Rees et al  
Awning fitting..... O. Whitmore  
Ax or tool handle wedge..... G. P. Morrill  
Axle and wheel. Car..... M. P. Gerbing  
Axle box dust guard..... A. Boren  
Bait holder..... V. Gebhardt  
Ball..... H. D. Day  
Ball float..... J. P. Burlingame  
Ball retainer..... L. Myers  
Bank. Child's..... J. Phillips  
Barrel head..... H. K. Mourning  
Bath tub trap..... J. H. Fitzgerald  
Bed..... J. Gillespie  
Bed. Folding..... C. L. Gerner  
Bed. Invalid..... R. L. Johnson  
Beds, &c. Leaf support for sofa..... O. R. Hunt  
Beer pasteurizing apparatus M. L. Fessenmeier  
Bell. Polarized electric..... F. B. Cook  
Belt driven elevator..... C. E. Torrance  
Beverages. Producing..... F. Brandner  
Bicycle..... H. P. Seymour  
Bicycle gear..... J. H. Trismen  
Bicycle. Spring frame..... J. H. Guiley et al  
Blanket roll strap or poncho holder..... J. H. Tabler  
Blind fascia. Snd..... S. Prebble  
Block signal system. Automatic A. G. Wilson  
Blowpipe rest..... W. H. Moon  
Boiler tube sheet..... G. H. Rheutan  
Bolt holder..... N. Grandchamp et al  
Bolt edge cutting machine..... E. Grosse  
Boot or shoe welt..... C. F. Wood  
Bottle filling machine..... G. Norton  
Bottle filling machine..... J. K. Wood  
Bottle. Non refillable.. 2 pats..... F. Ondra  
Bottle. Non refillable..... J. M. Stafford  
Bottle or jar stopper..... D. L. Bollermann  
Bottle washing apparatus..... R. B. Parker et al  
Bottles, jars, &c. Stopper or closure for..... W. S. Dorman  
Bottles or jugs with aerated liquids. Apparatus for filling..... A. Schroeder  
Box fastener..... C. W. Beecher  
Brake slack adjuster..... E. E. Crowell  
Bread..... G. H. Hosmer  
Brick truck..... C. A. Carlson  
Bricks. System of building..... C. Nathan  
Brush..... J. F. Runkle  
Brush holder..... C. A. Eck  
Brush strap fastener..... F. H. Loveless  
Buckle..... G. S. Geddes  
Buckle..... J. S. Sourek  
Buckle..... H. Uhlig  
Buckle. Belt..... L. Sanders  
Buckle. Safety..... A. Englerth et al  
Bulldozer..... J. S. Goldberg  
Butcher's blade bone extractor K. Wintsch, Jr  
Butter mold..... W. S. Farnsworth  
Butter printer..... T. L. Valerius  
Butter making machine..... G. W. Pelton  
Button or stud. Collar or cuff..... K. Benedict  
Cabinet. Dining room..... S. J. Givan  
Cake beater..... G. Friedman  
Cake dropping machine. Cup W. J. Melikham  
Calcing furnace. Quicksilver ore J. M. Cutler  
Cam..... W. H. Daily  
Can attachment. Oil..... W. L. Chrysler et al  
Can heading machine..... 2 pats..... W. H. Smyth  
Canned goods. Apparatus for steaming and processing..... J. Jennings  
Car. Bank or mine..... G. D. Williams et al  
Car brake..... F. P. Thomas  
Car brake mechanism..... W. S. Howland  
Car closure. Street..... C. S. Sapp  
Car construction. Steel..... T. F. Barke  
Car coupling..... S. Tobin  
Car. Dumping..... W. H. Davis  
Car fender. Street..... E. Melzer  
Car grain loader..... H. L. Moebeck  
Car hand strap attachment. Street C. Andress  
Car heating apparatus. Railway..... T. Parker  
Car roof..... L. S. Flatau  
Cars. Electric lighting apparatus for railway..... R. M. Newbold  
Card cutting machine. Jacquard..... V. Royle  
Carpet fastener. Stair..... A. Thrill  
Cartridge..... F. E. Young et al  
Carving machine bit..... V. Winquist  
Castings. Making..... C. H. Bierbaum  
Catch. Safety..... C. D. Heaton  
Ceiling. Metal..... A. Friedley  
Chair..... L. H. Clark  
Chair..... O. C. Dorney  
Chair adjustment..... H. W. Bolens  
Check hook..... L. C. Hiller  
Chisel..... N. H. Smith  
Chocolate dipping machine..... P. J. Costello  
Chin cover..... R. J. Poole  
Cigar bunching machine..... F. C. Smalstig

Cigar mold and lifter..... J. Brach  
Cigar trimmer..... M. E. Pugh  
Cigarette machine..... E. B. White  
Circuits. Means for regulating alternating current..... W. A. Layman et al  
Clevis..... W. R. Jenkins  
Cloth folding device..... A. Maxson  
Clutch coupling. Friction..... T. C. Walker, Jr  
Clutch. Friction..... J. H. Hendrickson  
Coal or rock drill..... I. Wantling  
Cock. Gage..... H. B. Souders et al  
Composition of matter..... E. F. Schwiart  
Compound engine..... C. C. Hill  
Computer. Pay roll..... H. B. Carlton  
Cooking utensil..... M. J. Wheeler  
Cooling device..... A. Glebsattel  
Cops holder..... H. C. Hinchcliff  
Copy holding attachment..... E. W. Briggs  
Core barrel. Collapsible..... C. W. McWane  
Corn shelling implement..... A. C. Harrell  
Corset..... A. M. Donshea  
Corset..... E. Savoye  
Counter skiving machine..... W. C. Stewart  
Coupling..... J. R. Carter  
Crate. Collapsible..... G. Greer  
Culinary device..... W. H. Barnes  
Cultivator, lister, and grader..... S. Mower  
Curtain stretcher frame..... J. J. Deal  
Curtain support..... C. A. Needham  
Cuspidor..... B. Z. Judie  
Cut offs. Automatic attachment for eaves trough..... O. E. Hunt  
Cycle. Motor..... J. F. Merkel  
Cycles. Chair seat above front wheels of..... J. Otterbein  
Dam construction..... M. D. Rochford  
Dental cutting tool..... W. C. Gillespie  
Dental piers..... V. W. Gilbert  
Depth gage..... H. C. Hansen  
Developing tray..... W. H. C. Dudley, Jr  
Dish washing machine..... L. B. Gregg  
Disinfecting compounds. Producing..... R. G. Groppler  
Displaying drawings or prints. Frame for..... H. D. Pursell  
Door fastener. Sliding..... F. G. Dickey  
Door. Grain..... J. E. Drake  
Door. Grain..... J. O. Oakley  
Draft equalizer..... S. L. Pattison  
Draft rigging..... H. C. Friebe  
Draw gear and buffing apparatus..... E. M. Herr  
Drawer. Dust proof..... O. C. Mosen et al  
Drier..... E. E. Turney  
Drink shaker..... N. Lattard et al  
Dumb waiter operating mechanism..... N. Beckwith  
Dust guard..... J. J. Busenbenz et al  
Dye and making same. Acridin..... C. Ris et al  
Dye and making same. Black mordant..... C. Ris et al  
Dye and making same. Mordant disazo..... A. L. Laska  
Dye and making same. Substantive black..... A. F. Poirrier  
Dynamos on railway trucks. Mechanism for driving..... P. Kennedy  
Educational and puzzle block..... R. W. Mansfield  
Electric cut out..... J. Erikson  
Electric light. Portable..... H. S. MacKaye  
Electrical characters and means for forming same. System of..... D. J. O'Brien  
Electrical connections. Swivel attachment plug for..... T. Van Ailer  
Electrical distribution system..... A. E. Doman  
Electrical outlet box..... H. Krantz  
Electrotherapeutic appliance..... W. B. Bassell  
Elevator and dump. Combined..... G. D. Walker  
Elevator bucket..... I. F. White  
Elevator door opening or closing device..... H. M. Jenkins  
Elevator locking device..... D. C. Jenkins  
Elevator locking device..... H. M. Jenkins  
Elevator mechanism..... G. Visco  
Elevator safety appliance or attachment..... G. Holger  
Engine controlling device. Automatic..... H. J. Mohlenhoff  
Engine cooling attachment. Internal combustion..... J. W. Sutton  
Engine gasoline and air feed device. Gas..... R. P. Thompson et al  
Engine steering mechanism. Traction..... G. E. Wilkinson  
Engines. Electric spark for explosion..... E. C. Richard  
Engines. Electrical sparking igniter for gas..... T. L. & T. J. Sturtevant  
Engines. Superheating the driving mediums of cold vapor..... A. Houkowsky  
Engraver's block..... F. Thirion  
Evaporator tube..... S. M. Lillie  
Exercising machine..... J. C. Korth  
Explosion engine..... G. F. Jaubert  
Eye forming machine..... C. M. Lamb et al  
Eyeglass guard..... J. C. Welis  
Eyeglasses..... H. Brinkhaus  
Feed water heater..... R. H. Hornbrook  
Feed water heater..... R. H. Fraser  
Feed water purifier..... T. O. Organ  
Fence post..... J. C. Simmons  
File. Letter..... A. Dom  
Filling machine..... G. W. Blake  
Filter..... A. H. Kohlmeier  
Filter. Oil..... W. F. Warden  
Fire alarm and sprinkler system. Automatic..... F. K. Lindlow  
Fire escape..... J. H. Prouty  
Fire signal..... J. H. Dixon  
Fish hook..... F. H. Pardon  
Fishing bob..... J. S. Scott  
Flange..... F. C. Billings  
Flax carrier..... J. Degendorfer  
Flour bolts, &c. Cloth cleaning attachment for..... J. Charles  
Flue. Smoke and air..... C. Faust  
Fly paper. Sticky..... O. A. Jones  
Fodder. Machine for the manufacture of molasses..... R. Schrader  
Folding table..... J. P. Gaertner  
Frame..... J. Koster  
Fruit drier..... A. A. Quarnberg  
Fruit washing machine screen..... E. J. Kessler  
Fuel. Device for producing and consuming hydrogenic..... A. G. Ingalls  
Funnel..... B. Paulini  
Furnace..... H. B. Cary  
Furnace..... 2 pats..... J. MacCormack  
Furnace door operating device..... L. I. Newton  
Furnace draft. Auxiliary..... T. Young  
Furnace spraying attachment..... J. O. Morris  
Furnaces. Utilizing the products of combustion of steam boiler..... G. A. Schutz

Game apparatus..... S. Levin  
Game device. Puzzle..... J. W. Hughes  
Game piece. Conversational..... W. Chaffin  
Garment fastener..... N. V. Croom et al  
Garment folding apparatus..... J. McKay et al  
Garment supporter..... H. L. Gall et al  
Gas burner..... E. O. Daniels  
Gas burner..... J. Guimaraes  
Gae burner. Acetylene..... W. T. Free  
Gas compressing machine..... T. McIntyre  
Gas cut off. Automatic..... V. E. Campbell  
Gas engine..... G. Joranson  
Gas from gas generators during stoking. Apparatus for preventing escape of..... J. Hofmann et al  
Gas generator. Acetylene..... T. F. Williams  
Gas main stopper..... E. A. Behringer  
Gas or vapor lighting. Apparatus for incandescent..... W. Hooker  
Gasket. Water gage..... H. K. Gilbert  
Gate..... S. A. Taylor  
Gear. Reversible transmission..... J. A. Dickey  
Gear. Variable speed .. 2 pats..... J. S. Fairfax  
Gearing. Variable speed..... W. N. Dumaresq  
Gold, silver, brass, &c. Composition of matter for use in polishing..... R. Scannell  
Golf club..... R. H. White  
Governor..... J. Scherer  
Governor..... J. B. O'Donnell  
Grain bin ventilator..... H. A. Hannum  
Grain separator..... E. M. Kramer  
Grate..... H. E. Parson  
Grate. Duplex..... J. O. Little  
Grinding mill. Ball..... P. T. Lindhard  
Grinding mill quick release device..... S. Snyder  
Gun barrels or tubular articles. Apparatus for testing and straightening..... A. H. M. Driver et al  
Gun cleaning rod..... H. A. Tellerson  
Gun gas check. Breech loading..... V. C. Tasker  
Gun trigger mechanism..... K. Voller  
Hame and trace connector..... T. E. Kellogg  
Harrow. Riding..... M. Langellier  
Harvester..... H. Traeger  
Harvesting machine..... J. W. Taylor et al  
Hat..... R. Plato  
Hat fastener. Lady's..... J. T. Bluff  
Hat holder..... M. F. Bishop  
Hat holder. Lady's..... M. C. Winter  
Hat shaping die..... M. A. Cumming  
Hay rake..... W. Lincoln  
Header..... C. W. Harvey  
Heating and lighting apparatus. Combined..... C. B. Clark  
Heating furnace. Reverberatory..... S. Uren  
Hinge. Seat..... L. D. Petre  
Hog tongs..... J. L. Vanderburg  
Hoist. Chain..... J. Johnson  
Hoisting device for sacks, boxes, &c..... C. Serley  
Horn stand or support..... A. S. Marten  
Horseshoe..... G. W. & W. H. Bradley  
Horseshoe pad..... A. Larsen  
Hose coupling..... C. W. F. Kroll  
Hose supporter..... M. Marks  
Husking machine..... G. R. Sherwood  
Hydraulic brake..... J. Bardsley et al  
Ice cream storage tank..... E. Walker  
Index..... H. P. Jones  
Induction motor..... R. E. Williamson  
Inkstand..... R. H. Young  
Insulating handle connection..... D. Heer  
Interchangeable wrench..... O. E. Covar  
Iron or steel alloys. Forming diamond draw plates in..... F. Krause  
Jack..... W. R. Lewis  
Journal lubricator..... B. R. Stare  
Journal lubricator..... J. J. Busenbenz et al  
Ladder. Collapsible..... G. W. Naylor  
Ladle for carrying and tipping blast furnace slag..... J. H. Dewhurst  
Ladies for carrying and tipping blast furnace slag. Carriage for..... J. H. Dewhurst  
Lamp bracket or holder for miners' lamps..... W. Israel  
Lamp burner..... C. E. J. Grube  
Lamp. Gas..... C. W. Carrier  
Lamp. Hydrocarbon..... J. Bystrom  
Lantern bottom..... F. W. Dressel et al  
Lantern bottom..... T. J. Little, Jr  
Last. Darning..... D. H. Cox, Jr  
Lasting. Means for securing shoe uppers preparatory to..... W. A. Smith  
Lasting tool. Hand..... S. Beauregard  
Lathe..... C. Glover  
Lawn shears..... J. G. Thrasher  
Leather. Machine for treating skin or shank..... A. F. Stowe  
Leather stock moistening apparatus..... R. W. Blaisdell  
Letter boxes. Adjustable indicating dial for..... G. H. Huntington  
Level and inclinometer. Combined T. S. Tilley  
Lever. Ratchet..... L. P. Jacobs  
Lifting jack..... W. W. Simonton  
Limb. Artificial..... J. K. Shanahan  
Limb support..... 2 pats..... G. E. Brown  
Linotype machine..... J. R. Rogers  
Linotype matrix cleaner..... C. P. Rubly  
Loading or unloading apparatus..... W. T. Smith  
Lock and latch. Combined..... A. M. Doyle  
Logging car stake holder..... E. Ludford, Jr  
Loom needle motion. Pile fabric A. J. O'Reilly  
Loom. Swivel..... J. Wadsworth  
Lubricator..... J. A. Erickson et al  
Lubricator..... C. L. Hofmann  
Malt turner..... J. Mueller  
Match box..... B. F. Daniels  
Match box. Single delivery..... E. C. Davey  
Match safe..... J. J. Sullivan  
Measure for gloves. Hand J. J. Summesby et al  
Mechanical movement..... J. D. A. Johnson  
Medication of air. Apparatus for the..... J. & W. Titus  
Mercurous chlorid..... C. H. von Hoessle  
Metal rods, &c. Machine for cutting off..... C. H. Veeder  
Metallic mat..... P. J. Shrum  
Milk crock hoop or band..... C. M. Brouson  
Mine. skips, cages, &c. Safety gear for..... W. B. Stevenson  
Miner's safety cage..... F. C. Kerst  
Mining apparatus. Phosphate..... J. Beatey  
Mixing device..... D. S. Goss  
Mold washing machine..... J. L. Barrick  
Monoformyl derivative of 1-3 dimethyl 4-5 diamido 2-6 dioxypyrimidin. Making the..... M. Englemann  
Motion converting mechanism..... G. L. R. A., C. B., & H. E. Griffin

Motion driving and reversing mechanism..... W. & G. F. Meischke-Smith  
Motion. Means for preventing lost..... G. W. Schock  
Motors. Controller for weight-operated..... R. W. Page  
Mower..... 2 pats..... A. Hart  
Music box star wheel..... F. A. Richter  
Musical instrument..... J. H. Tann  
Musical instrument..... R. J. Bennett  
Musical instrument. Pneumatic self playing..... F. F. Schoenstein  
Musical instruments. Pneumatic action for self playing..... T. P. Brown  
Night light..... F. Hirth  
Nozzle..... W. C. Oberwalder  
Nut lock..... W. A. Young  
Oil burner..... L. H. Wattles  
Oiler. Automatic..... B. Poulson  
Oven. Mechanical..... P. F. Carroll  
Package. Merchandise..... F. H. Roberts  
Paper folding machine..... 2 pats..... G. W. Schock  
Paper roll holder and cutter..... W. E. Blue  
Paste pot..... C. B. Gordon  
Pea blanching apparatus..... H. D. Hutcheson  
Pedometer-pendant..... W. E. Porter  
Pen. Fountain..... J. Blair  
Pencil holder..... I. T. Alvord  
Pencil sharpener..... C. F. Littlejohn  
Pencil sharpener..... L. G. Wilcox  
Photographic plate holder..... G. A. Hagner  
Photographic ray filter..... R. H. Stocum  
Pianos or other musical instruments. Bass string for..... A. D. Ramacioti  
Pianos, pianofortes, &c. Device for closing pedal openings in..... E. Hilger  
Picture hanger..... O. A. Wade  
Pill counting machine..... W. Brough  
Pipe bending tool..... C. W. Miller  
Pipe coupling. Train..... J. E. Forsyth  
Pipe shellacking machine..... C. O. Strutz  
Pipe threading machine..... B. Borden  
Pipes. Mechanism for running underground..... O. E. Blown  
Plant protector..... L. G. Hunter  
Planter. Seed..... W. H. Coble  
Planting machine. Seed..... U. A. Fitz Maurice  
Plate or sheet surfacing machine F. S. Brockett  
Plumber's sanitary cross..... J. L. Fruin  
Pole or post anchor..... I. E. Clum  
Potato bug catcher..... W. E. Southwood  
Poultry, game, or bird rearing apparatus, partly applicable to hatching apparatus..... R. S. H., M. L. G. E., M. H. S. H. & J. Youde  
Precious stones. Holder for cutting..... H. W. Oostendorp  
Printing machine bed motion..... E. T. Cleathero  
Printing or similar machines. Sheet delivery mechanism for..... F. J. Wich et al  
Printing press attachment..... S. G. Goss  
Projectile..... S. A. Groff  
Projectile..... I. N. Hamilton  
Projectile. Enveloped..... H. Platz  
Propulsion. Marine..... A. J. Taplin  
Pulverizing apparatus..... W. A. Koneman  
Pump..... R. L. Benson  
Pump..... G. W. Meyer  
Pump. Air lift..... J. P. Couse  
Pump. Oil..... J. T. Bradford et al  
Rail bond..... L. Pfingst  
Rail joint..... V. Flannigan  
Rail joint fastener..... W. H. Logau  
Railway gate..... G. E. Jackson  
Railway train arrest..... C. Yingling  
Razor. Safety..... J. Guinan  
Razor safety attachment..... J. Guinan  
Reclining chair..... 3 pats..... W. A. Wylie  
Refrigerator drip pan attachment..... A. Bessette  
Rheostat..... J. C. Vetter  
Rheostat..... A. Eimer  
Rivets, &c. Portable heater for heating..... J. & T. Macdonald  
Road machine..... W. A. Heuser et al  
Roasting furnace..... C. H. Repath et al  
Rock drill..... W. Brady  
Rock drill attachment..... D. A. Owen  
Rocking chair..... B. Klein  
Rolling mill feeding mechanism..... J. R. George  
Ropeway gripping apparatus. Aerial..... W. Eichner  
Rotary engine..... L. V. Sutton  
Rotary motor..... N. A. Patschke  
Rotary piston engine..... C. E. Hite  
Rotary steam engine..... T. Duysens et al  
Routing cutter..... J. L. Perkins  
Rowlock for metallic boats..... J. L. Burton  
Rubber heel holder..... P. A. Jahn  
Rule..... J. F. Bush  
Rule for measuring openings..... E. Hipolito  
Sad iron..... O. Tverdahl  
Sad iron handle..... W. C. Fawkes  
Sad iron support..... A. Lapinski  
Sand, gravel, &c. Apparatus for washing..... P. Maurice  
Sarcophagus..... C. P. Landon  
Saw file attachment..... O. B. Blocher  
Saw filing device..... R. Evans et al  
Sawmill set works..... J. Scherer  
Saw set..... H. Caldwell  
Saw tooth swage. Insertible..... J. F. Finnegau  
Sawing machine..... W. H. Clendenon  
Sawing machine. Head block..... G. F. Wissmann  
Scaffold..... M. A. Cheves  
Scaffold bracket..... W. Michael  
Scale. Platform..... C. H. Vincent  
Scoop. Gathering..... W. E. Hamilton  
Scraper. Road..... O. T. Patterson  
Section liner..... R. Kastmann  
Seeding machine..... A. O'Connor  
Sewing machine attachment holder..... J. M. Greist  
Sewing machine. Buttonhole..... F. L. Harmon  
Sewing machine cabinet..... E. E. Manning  
Sewing machine embroidering attachment..... A. Hochstrasser  
Sewing machine folding and ruffling device combined..... J. Douglas  
Sewing machine horn..... I. A. Cook  
Sewing machine tuck folding guide..... J. M. Greist  
Shade and curtain pole bracket. Window..... V. Hildebrand  
Shafts and wheels. Flexible connections for drive..... W. E. Hamilton  
Sharpener. Knife..... F. Foster  
Shears. Combined split and crosscut..... F. G. Koehler  
Sheep shears..... J. F. Burgher  
Sheet metal cutting machine..... E. Zeh  
Sheet feeder control..... E. T. Cleathero



Sheet feeding apparatus. Lifter for pneumatic shoe. Electric. E. T. Cleathro  
Shoe. Electric. J. W. Gibbs  
Shoe jack. W. A. Blain  
Shovel nose. W. E. Hamilton  
Show box lid. W. D. Harrison  
Shredder cylinder. W. A. Bush  
Shutter bower and fastener. C. Zimmerman  
Shutter or blind slats. Device for fastening. W. W. Du Bois  
Sieve. Flour. E. M. Jones  
Signaling apparatus. Marine. W. J. Smith  
Sink overflow attachment. J. Blum  
Skein holding device. F. Benzinger et al  
Skin diseases, &c. Apparatus for treating. J. K. Jeldsen  
Sleigh. Bob. J. K. Jeldsen  
Smoke machine. G. W. Heiland  
Smoke preventer furnace. R. W. Cavanaugh  
Snap fastening. H. Booth  
Snapping rolls. H. L. Ferris  
Snow plow. F. Kiefer et al  
Soap cake. R. A. Jones  
Soap cakes provided with inserts. Making. W. Berry  
Soap frame. E. A. Houchin et al  
Soap holder. J. S. Roake  
Sodium. Acetylsalicylate of. B. R. Seifert et al  
Sole edge burnishing machine. 2 pats. C. F. Stackpole  
Sound transmitter appliance. S. J. Ballard  
Souvenir. G. Fantoni  
Spark arrester. F. J. Wilke  
Spark gap. J. O. Heinze, Jr.  
Speed and direction indicator. B. A. Fiske  
Speed indicator. Rotary. H. W. Schlottfeldt  
Spice puller. A. Gartshore et al  
Spinning frame guide eye. W. O. Aldrich  
Spittoon. Flushing. M. A. Coykendall  
Spool making machinery. J. S. Goldberg  
Spring structure for seat or bed bottoms. L. H. Lawhon  
Sprocket wheel. A. Langerfeld  
Stack anchor. J. Monahan  
Stacker. Straw. W. N. Rumely  
Stamp affixer. J. Olsen  
Stamp. Drop. B. Lohr  
Star wheel. F. A. Richter  
Steam boiler. G. H. Rheutan  
Steam trap. H. H. Humohrey  
Steam trap. G. M. Hilger  
Stencil. E. A. Wilcox  
Still. Ammonia. E. A. Moore  
Stirrup. J. Wright  
Stirrup and connections therefor. W. J. May  
Stove. Combined heating and cooking. T. J. March  
Stove. F. J. Smith  
Stove hot air feeder. A. E. Whitney  
Stove self-feeding attachment. Cooking. N. Joergensen  
Strength testing device. R. Stock et al  
String cutter. G. R. Butler  
Sulfid ores. Treatment of. A. M. G. Sebillot  
Sun dial. E. G. Hewitt  
Suppository. A. H. Peloubet  
Suspenders. E. McGuire  
Swath turning implement. S. A. Peto  
Switch joint. Hinged. W. A. Fort  
Switch stand and lock. H. H. Warner  
Table frame. S. P. Giddings  
Telephone switchboard timing device. B. F. Merritt  
Temperature chart. O. Wider  
Temperature of substances to be heated. Apparatus for controlling. C. F. Ruby  
Theater seat attachment. S. W. Van Nostran  
Threshing machine cylinder tooth. J. Dahl  
Tile or shingle. Metal roofing. A. Friedley  
Tire for vehicle wheels. Cleucher  
Tire. Pneumatic. A. de Laski et al  
Tobacco leaf stripping machine. G. A. Marier  
Tobacco pipe. S. Wenzel  
Toothpick. J. A. Ohlsson  
Toy. D. Gibbs  
Toy. F. R. Davis  
Trace. F. D. Thoman  
Track laying indicator. L. Dunn  
Track sweeper. B. Hemann  
Tripod. H. H. McNaughton  
Trolley. B. Stenvall  
Trolley pole. J. F. Mackin  
Truck. T. H. Brown  
Truck. Car. E. W. Summers  
Truck. Car. W. B. Bettendorf  
Truck. Lumber. J. Barker  
Truck wheel. Adjustable. W. E. Hamilton  
Tube bending machine. C. A. Briegel  
Tubing. Apparatus for the manufacture of seamless. J. H. King et al  
Tubular articles. Testing for or detecting and correcting faults or errors in. A. H. M. Driver et al  
Turbine. Steam. J. Richards  
Turbine. Steam. A. J. Taplin  
Twisting machine stop motion. G. I. Fiske  
Type bar bearing. L. Myers  
Type space and means for co-operating therewith for justifying lines of type. C. H. Cochran  
Type writer desk. F. H. Howe  
Type writer ribbon reversing mechanism. W. F. Helmond  
Type writer tabulating device. L. Myers  
Type writing machine. J. Feibel  
Type writing machine. H. W. Merritt  
Type writing machine extensible platen. H. J. Halle  
Umbrella. 2 pats. T. Pachali  
Valve. J. B. Waring  
Valve. W. F. Singer  
Valve. J. H. Clune  
Valve. Acid. J. Koch  
Valve. Combined hand and automatic shut-off. N. C. Locke  
Valve. Dry pipe. F. H. Rice  
Valve. Engine. O. W. Young  
Valve. Float. E. Benson  
Valve. Reducing. J. B. Waring  
Valve. Reducing. S. Munson  
Vehicle body. C. J. Moore  
Vehicle door and seat. Combined. L. S. Chadwick  
Vehicle driving mechanism. Motor. F. D. Howe  
Vehicle. Motor. D. P. Sanders  
Vehicle. Motor. J. H. MacAlman  
Vehicle oscillating body support. C. N. Conlee  
Vending machine. J. A. Williams

Vehicle transmission gearing. Motor. F. J. Porter et al  
Vending machine. Coin. C. R. Smith  
Vending machine. Coin controlled. F. G. Hartell  
Ventilator. W. F. Slack  
Wagon. S. H. Boone et al  
Wagon brake. C. E. Sherman  
Wall cleaner. E. Hilker  
Warp stop motion. A. P. S. Macquisten  
Waste and vent system. J. L. Fruin  
Water closet. G. W. Knapp et al  
Water. Hydraulic plant and vessel or reservoir for containing. C. Coda  
Water motor. Impact. S. Rawlings  
Waterer. Automatic hog. B. F. Booth  
Well driving hammer. T. D. Westbrook  
Whiffletree hook. J. E. Taylor  
Winding machine. S. W. Wardwell  
Window and shutter operating device. E. Van Noorden  
Window fixture. G. Wolfe  
Window screen. H. L. Peters  
Window screen mechanism. C. Bimel  
Window. Swinging. E. Van Noorden  
Wire or like cutter. E. Baartmans  
Wire stretcher. P. M. Darst  
Wire working tool. P. Broadbent  
Wrapping machine. T. G. McGirr  
Wrapping machine. G. P. Davis  
Wrapping machine. Box. F. Henry  
Yarns, &c., with volatile liquids. Treating. J. E. Prestwich  
Zinc peroxid. Making. F. Elias

## DESIGNS.

Basin. Wash. 4 pats. J. Zipp  
Bottle. J. W. Wood  
Brooch, button, or buckle plate, &c. C. M. Wendelstein  
Card back. Playing. M. H. Davis et al  
Handkerchief. A. H. Broadway  
Register plate. E. C. Fox  
Spoons, forks, or similar articles. Handle for. P. J. Cheron  
Spoons, forks, or similar articles. Handle for. E. Crees et al  
Toy money bank case. A. H. Kimberling

Issued October 13, 1903.

## MECHANICAL PATENTS.

Aerial navigation apparatus. C. E. Van Deventer  
Air brake for motor road vehicles. H. Ledermann  
Air brake. Railway automatic emergency. J. P. Birmingham  
Air draft heater. J. McDermott  
Alarm system. E. H. Ballou  
Album stand or support. G. Schwab  
Automobile sleigh attachment. M. Abrahamovitz  
Automobile steering device. R. D. Demory  
Awning. H. Oltrauns et al  
Axle. C. S. Caird  
Bag fastener. C. W. Bader  
Bag holder. J. H. Gmelin  
Barrel head. E. P. Hatch  
Bean grader. String. M. H. Butler  
Bearing. Roller. F. E. Brooks  
Bed. Folding. W. Harman  
Bedstead. Folding. M. Benz  
Belt tightener. Quick release. J. N. Kailor et al  
Billiard cloth. J. Turner  
Binder cord holder. Self. B. R. Benjamin  
Binder. Loose leaf. F. H. Thomas  
Bleaching, &c. Apparatus for. F. C. Theis  
Boat. Miniature or toy submarine. A. F. Humphrey  
Bodkin. A. G. Sessums  
Body support. W. U. G. Martin  
Boiler draft device. Steam. R. B. Hodge  
Book stub. Check. W. C. McCarter  
Boot or shoe. D. W. Corey  
Boring machine indicator. C. B. Weidlog  
Bottle. Non refillable. E. C. Rosenaw  
Bottle. Non refillable. C. C. Guernsey  
Bottle washing machine. N. Glab  
Bottles &c. Machine for hermetically closing. C. Jovignot  
Box and reel. Combined. W. H. Atkinson  
Brake beam. J. F. Scott et al  
Brake operating device. M. O'Brien  
Bread cutting machine. L. J. Odell  
Brewers' grain. Drying. L. Atwood  
Brick laying machine. J. H. Knight  
Brick machine. Cement. J. D. Luttrell et al  
Brick. Reflector. J. W. Ivory  
Briquetting machine. H. G. Layng  
Brush cover. T. B. Flower  
Buckle. E. Cleary  
Buckle. N. I. Hecht  
Buckle. Suspender. D. L. Smith et al  
Buffer. Differential. E. G. Shortt  
Building block molding machine. P. L. Britton  
Building construction. T. O'Shea  
Buildings, &c. Metallic finish for. N. Poulson  
Buoy. Gas. R. M. Dixon  
Burglar alarm. W. H. Fletcher  
Burial apparatus. J. E. Lawrence  
Burner tip. J. Doorenbos  
Bustle. H. H. Taylor  
Cabinet. R. T. Anderson  
Calendar holder. Memorandum. G. G. Greenburg  
Camera. Magazine photographic. J. Guimaraes  
Camera. Photographic. L. Borsum  
Can opener. G. O. Redpath  
Cane and whip. Combined. H. H. Brandes  
Cane. Combination. L. Robertson  
Car coupling. P. Luther  
Car coupling operating mechanism. Railway. W. F. Richards  
Car door hanger. J. Goettel  
Car. Hopper bottom freight. H. R. Keithley  
Car pipe coupling. Railway. C. Mahon  
Car replacer. J. D. Green  
Car seat. 2 pats. H. S. Hale  
Car step. Folding. A. P. Gunn  
Car track sanding device. Tram. C. W. Langridge  
Cars. Door for self discharging hoppers of railway or other freight. G. H. Sheffie d et al  
Cars, &c. Pneumatic safety appliance for street. J. Enright  
Carbonizing car. C. W. A. & J. Mettler  
Carpenter's and joiner's jack. Folding. W. F. Soety

Carbureter. Explosive engine. E. F. Clark  
Cash register attachment. T. Craney  
Casting small steel ingots. A. B. Chantaine  
Castings. Making. W. D. Sargent  
Ceiling construction. W. D. Ryan et al  
Cell case. J. H. Carter  
Chain. Drive. W. M. Butler et al  
Chain. Watch protecting fob. D. Summa  
Chair table attachment. J. A. Dale  
Chart. Harmony and transposition. E. W. Curtiss  
Cheese cutter. E. Niggl  
Cherry stoning device. H. von Uffel et al  
Chuck. Dredge. J. J. Hayman  
Chuck swivel stand. Lathe. C. E. Thiebaud  
Chute. Coal. M. J. Brennan  
Cigarette cartridges with tobacco. Machine for filling. J. Wojciechowski  
Cigarette machine. A. Greissamer  
Circuit breaker. J. D. Forrer  
Classifying or sizing apparatus. A. Ten Winkel  
Clevish. Draft equalizing. J. G. Evans  
Clock. Electric. F. W. Moore  
Clock. Electric program. E. T. Ackerman  
Closure. E. E. Chapman  
Clothes drier. G. M. G. & W. H. Weston  
Clothes pounder. O. Oines  
Clover cutter. H. B. Humphrey  
Coal hod and sieve. Combined. W. H. Bryar  
Coal screener and bagger. J. H. Gme in  
Coating. Antifouling. G. D. Coleman  
Coatings. Making antifouling. G. D. Coleman  
Coffee cooker. P. Renner  
Coffee pot. J. W. Vogan  
Coffee substitute. M. H. Just  
Colubarium cell. M. J. Mathews  
Combing machine. Circular. J. H. & A. R. Whitehead et al  
Compasses. Drawing. J. Wild  
Composition of matter. W. A. Lawrence  
Compositor's stick. F. W. Weeks  
Concrete or cement building block. J. H. Jones  
Condenser. C. A. Parsons  
Conveyer. Pneumatic. W. W. Annable  
Conveyer system. H. W. Blaisdell  
Cooking utensil. O. A. Lane  
Corner strip. F. L. Union  
Corset busks. Metal clasp for. E. D. Etienne  
Cotton gin. W. H. Baskin  
Cotton press. Oscillating. S. J. Webb  
Crane or like hoisting or lowering apparatus. A. H. Mitchell  
Crate. Banana. A. Sansone  
Crusher. W. W. Case  
Curb box and cock support. J. R. Flinn  
Current machine and apparatus. Continuous. M. Deri  
Curtain fixture. F. L. Bailey  
Cyanid solutions. Treating. W. H. Davis  
Dental appliance. L. A. de Rosa  
Desk attachment. J. Hoffman  
Digger. T. W. McFarland  
Distilling apparatus. Wood. A. A. McKethan  
Door hanger. J. H. Burkholder  
Door stop. W. Platt  
Dough mixing machine. H. H. Wilson  
Draft evener. A. B. Fogle  
Drawer bottom. E. Ohnstrand  
Drilling apparatus. C. A. Ott  
Dust arrester. L. D. Young  
Dust guard. G. H. S. Soule  
Dye and making same. Green sulphur. R. Gley  
Dyes. Making azo. F. Schoell  
Eaves trough. B. H. Gedge  
Eaves trough hanger. B. H. Gedge  
Egg beater. F. Maurer  
Electric furnace. F. E. J. Hatch  
Electric induction motor. E. H. Porter et al  
Electric generator. Turbine. E. H. Porter et al  
Electric switch. J. H. Rusby  
Electric terminal. H. R. Young  
Electrical conductors. Automatic coupling for. C. Mahon  
Electrical oscillations. Detection of. L. H. Walter et al  
Electrical switch. A. E. Handy  
Electricity meter. W. M. Mordey et al  
Electrolytic diaphragm. J. L. Roberts  
Electroplating apparatus. A. R. Pritchard  
Elevated carrier. H. H. Drew  
Elevator gate. W. H. Mehlun  
Elevator safety device. W. S. Fulwider  
Embroidery and manufacturing same. Ornamental. E. U. Buff  
End gate and shoveling board. F. J. Weston  
End gate and shoveling board. Combined. F. J. Weston  
Engine. W. S. McKinney  
Engine attachment. Traction. J. Saunders et al  
Engine ignition device. Explosion. H. Guillon  
Engine oil cup. G. F. Clarke  
Engine synchronizing device. Duplex steam. E. M. Coryell  
Engines. Cooling attachment for internal combustion. J. W. Sutton  
Engines. Electric igniter for hydrocarbon. J. W. Packard  
Engraving machine. Pantograph. M. Barr  
Equalizing mechanism for reciprocating machines. A. C. Eastwood  
Excavating machine. F. M. Bisbee  
Explosion engine. F. H. Smith  
Explosive engine. C. W. Spooner  
Explosive engine. F. Spohnle  
Extension table. Pedestal. J. Luger, Jr., et al  
Eyeglasses. F. F. Finch et al  
Fan construction. W. W. Burnes  
Fatty substances. Making. O. Liebreich  
Feed measure and box. J. A. Leighton  
Feed rack. J. M. Shotts  
Feed water heater and purifier. R. W. Jones  
Feeder. Boiler. M. Castelnuau  
Feeder. Time stock. G. A. Crotto  
Fence. W. C. Bay ess et al  
Fence machine. F. E. Smith  
Fence post. J. F. Martin  
Fence post. Composite. R. D. Hayward  
Fencing. J. W. Berry  
Ferrule applying machine. G. H. F. Schrader  
File. Paper. F. A. Weeks  
Filter. J. F. Ziegler  
Filter. Barrel. A. E. Johnson  
Filtering apparatus. J. Miller  
Fire box. W. D. Boyce  
Fire hose wrench. G. N. Thompson  
Fire kindler mold. E. C. Sachse  
Fireplace and grate. M. E. Travis  
Fireproof floor construction. E. Merrick  
Fireproof nailing brick. J. T. Taylor  
Fireproof structure. N. Poulson  
Flash light apparatus. C. A. Barrett et al

Flat iron holder. J. V. Askin  
Fleshing and shaving machine. E. Schroeder  
Floor jack. M. Neheim  
Floors, &c. Surface finish for. J. J. Blackman  
Flooring and constructing floors. F. L. Union  
Flour bolting brush. J. G. Peterson  
Fluid motor. Rotary. S. J. Webb  
Fluid operated engine. B. V. Nordberg  
Fluids. Means for preventing meddling with the flow of. C. W. Geekie  
Flushing tank. W. A. Williams  
Focal plane shutter. L. Borsum  
Forging machine. O. Briede  
Fork. J. A. Tornblom  
Foundry truck. W. F. & O. E. Maine  
Fruit pulp machine. C. R. Wilson  
Fuel. Artificial. F. C. von Heydebrand und der Lassa  
Furnace. C. J. Monfort  
Furnace. G. C. Cannon  
Furnaces. Means for utilizing oil or gas in ore reducing. W. K. Mip  
Furring. C. T. Puddy  
Gage. C. S. Labofish  
Game. W. F. Moughler  
Garment fastening. E. A. Pfeiffer  
Garment. Nether. A. F. Sipperley  
Garment supporter clasp. D. L. Smith et al  
Gas burner. Incandescent. E. W. Phelps  
Gas burner. Safety. M. F. Kerrigan  
Gas burner. Sectional. E. A. Hall  
Gas cut off. Automatic. T. R. Jenkins et al  
Gas generator. Acetylene. E. R. Angell  
Gas purifier box. E. F. Lloyd  
Gasoline engine. J. A. Nickelson  
Gate. P. W. Robinson  
Gate. H. R. Dansboe  
Gate. W. A. Peeples  
Gear. Reducing. H. H. Young  
Gear. Transmitting. F. D. Howe  
Girder, &c. Composite. G. A. Weber  
Glass. Manufacturing wire. N. Franzen  
Glass sheets or plates. Annealing. H. K. Hitchcock  
Glove. W. C. Wefel  
Glycerin and acidylated derivatives of aromatic bases and the product thereof. Producing. O. Liebreich  
Gluing machine. J. A. Hrubecy  
Gold saving apparatus for dredging machines. reissue. J. H. Gray  
Governor. Speed. W. S. McKinney  
Grain storage tank. G. H. Warren et al  
Grate bar. T. J. Pritchard  
Grave filler. S. Schlachter  
Grinding machine. 3 pats. H. D. Hibbard  
Grinding machine. Knife. P. Nousse  
Grinding mill. G. Zarniko  
Gum. Extracting. W. A. Lawrence  
Gum extracting apparatus. W. A. Lawrence  
Gun. Breech loading breakdown. G. D. Potter  
Gun lock mechanism. Breakdown. O. Kirmse  
Guns. Adjusting gage for subcaliber. V. C. Tasker  
Guns. Auxiliary barrel for breech loading. V. C. Tasker  
Harness. G. R. McCoy  
Harrow. H. Hailey  
Harrow and cultivator. Convertible. W. F. Sheppard  
Harrow or similar implement. W. F. Sheppard  
Harvester. Sugar cane. L. Decay  
Hat bodies. Uniting bats to. R. L. Gordon  
Hat fastener. B. von Frantzius  
Hay loader. C. E. Colbert  
Hay rake. Horse. L. Brown  
Headlight dimmer. H. S. Teal  
Hearing. Apparatus for the treatment of defective. G. C. Powell et al  
Heating system. Hot water. A. B. Beck  
Heating system. Vacuum. G. H. Reynolds  
Heel or sole protectors. Machine for inserting. B. F. Mayo  
Hoist. Electrically driven suspensible. F. A. Waldron  
Hoop coiling machine. S. J. Caroland  
Hopper. H. D. Conway  
Hopple. F. Filbey  
Horse check. G. M. McLean  
Horseshoe. F. N. Cline  
Horseshoe. F. D. Goodlake  
Horseshoe calk. S. Malmquist  
Hot air pipe. S. E. Ellis  
Hydraulic elevator. J. H. Adams  
Hydraulic indicator. F. W. Jones  
Hydrocarbon burner. S. Denison  
Ice cream dipper. J. F. Craven  
Ice spur or creeper. M. P. Link  
Incubator thermostat. F. W. Burd  
Index and balancing attachment for ledgers. H. E. Jones  
Indicator. J. J. Slavin  
Inking roller. J. J. Rafters  
Internal combustion engine. R. Jensen  
Ironing board. J. H. Knowles  
Ironing machine. G. E. Norris  
Ironing machine. J. J. O'Shea  
Jack-o'-lantern. M. L. Barnes  
Jar cover. T. A. Schmidt  
Joint support. reissue. R. Stanton  
Journal bearing. C. Erickson  
Key fastener. W. M. Thomson  
Knitting machine. R. I. Creelman  
Lace tipping machine. J. R. Dennis  
Ladder. C. D. Phipps et al  
Lamp. Combined heating and illuminating. P. J. McLaughlin  
Lamp. Electric arc. G. M. Lane  
Lamp or candle. Electric. C. Hubert  
Lamp. Petroleum. S. Carlson  
Lamp protector. W. H. Greenwood  
Lathe accessory. J. Wright  
Lathe for cutting and turning coracub pipe sections. J. Yerkes  
Lathe or planer tool holder. J. Brandstetter  
Leaching tank. W. E. Holderman  
Leg. Artificial. O. P. R. Pold  
Level. Spirit. A. J. Mercer  
Life preserver. G. W. Mitchell  
Line holder. W. J. Doty  
Linotype machine. H. B. Bartlett  
Liquid separator. Centrifugal. M. L. Hoyt  
Load retaining and releasing means for vehicles. W. M. Cain  
Loading or unloading apparatus. J. A. Pastureau  
Locket. H. E. Clapp  
Loom dooby. J. A. Clark  
Loom for weaving narrow ware fabrics. Needle. E. H. Ryon  
Loom let off motion. H. Widmer



Loom for weaving pattern fabrics..... H. Panitschek et al  
Loom pattern chain..... J. T. Cyr  
Loom picker stick motion..... O. A. Sawyer  
Loom warp stop motion..... J. F. Dustin  
Lubricating apparatus..... L. Friedmann  
Luggage carrier..... J. O. Eibler  
Mail box, Rural..... T. Hamilton  
Map carrying device support..... P. R. Builard  
Match boxing apparatus..... 2 pats.  
..... J. C. Donnelly  
Match. Wax..... A. J. Fredrikson  
Mattress. Wire..... C. S. Lloyd  
Meat hanger..... J. C. Garratt et al  
Mechanical movement..... J. T. Hogan  
Melting furnace..... E. Kirk  
Metal. Machine for making expanded..... J. F. Craven  
Metal roll. Composite..... C. J. Reed  
Metallic pole..... C. L. Wilson  
Milling machine link cutting attachment..... A. E. Kastien  
Molding apparatus..... R. M. Hale  
Molding machine..... H. G. Voight  
Motor..... S. A. Gibbs  
Motors. Means for preventing fluctuations in rotary..... J. J. Wood  
Mowing machine..... N. Nilson  
Music roll and book carrier. Combined..... W. W. Harrington  
Music roll for mechanical players J. Courville  
Music sheet feed mechanism..... A. P. Roth  
Nitrogen compounds. Production of..... G. de Chalmot  
Numbering machine..... C. R. Culley  
Nut lock..... A. W. Whitfield  
Odometer..... C. H. Veeder  
Oil can..... J. B. Beam  
Oils. Refining mineral..... T. Macalpine  
Oiler..... G. T. Allen  
Ore dearsenicating and amalgamating apparatus..... T. H. Hicks  
Ore roasting furnace..... J. Roger  
Ores. Treating..... C. E. Baker et al  
Oven ventilator..... J. F. Ferry  
Overseaming and blindstitching machine..... I. P. Davis  
Packing. Piston..... M. Montgomery  
Panel work or wainscoting..... D. P. Miller  
Parcel carrier..... A. D. Swegle  
Paper box machine..... C. W. Gay  
Paper cutting machine..... A. C. Hilsinger  
Paper turning in and pasting machine..... C. F. Root et al  
Pasting or gluing machine..... F. D. Taylor  
Pearl threading machine. Automatic..... A. R. Durante  
Pen holder..... J. W. Eetes  
Pen. Marking..... J. La Burt et al  
Pessary..... L. Knopf  
Photograph or graphophone, &c..... W. E. Clifton et al  
Photographic developing apparatus..... C. A. Barrett et al  
Photographic or other prints. Treating..... W. P. Warren  
Photographic plate holder. Magazine..... C. A. Barrett et al  
Photographic retouching frame J. F. Patton  
Photographic shutter. Adjustable..... T. Willis  
Pill machine..... E. C. Clark  
Pipe coupling. Train..... C. C. Mahon  
Plow. Disk..... S. V. Weeks  
Pocket book..... C. L. Hille  
Pole changer..... W. F. Warner  
Portable boiler or heater..... R. Meldrum  
Portable elevator..... J. E. Camp  
Portable press for hay, &c..... F. McKean  
Potato digger shaker..... L. J. Stark  
Power translating system..... A. C. Eastwood  
Precious metals. Apparatus for extracting..... H. H. Thompson  
Printer's quoin..... W. H. Lynchard  
Printing machine. Multiple color and text..... M. Rudometoff  
Printing purposes. Producing positive chromatinized colloid designs on plates for..... M. Rudometoff  
Printing surface and making same. Polychromatic..... A. von Beust  
Projectile..... S. A. Groff  
Projectors. Fine adjustment for R. W. Bailey  
Pump..... G. J. Kennedy  
Pump. Double acting force..... W. W. Knitz  
Pump rod lifter..... T. H. Tregellas  
Pump valve. Standing..... W. L. Betts  
Punching machine. Multiple..... 2 pats.  
..... J. S. Stevenson  
Punching or analogous machines. Spacing appliance for..... G. M. & R. M. Hunter  
Punka..... S. R. Baildon  
Puzzle..... I. R. Taylor  
Pyroxylin compound..... R. C. Schupphaus  
Radiator..... J. Kelly  
Radiator seal. Steam..... J. L. Judge  
Rail fastening and cross tie..... T. W. Hughes  
Rail joint..... 3 pats..... C. H. McKee  
Rail joint..... G. W. Johnson  
Rail joint..... A. M. Beason  
Rail joint..... J. E. Davis  
Rail shoe. Third..... J. E. Blakesley  
Rail support or chair. Third..... J. E. Blakesley  
Rails. Connection for the meeting ends of..... T. Gardin  
Railway joint and chair..... W. C. Bales  
Railway signaling system..... A. G. Dahmke  
Railway switch and operating means therefor..... A. J. Backer  
Railway switch operating means..... J. O. Dimmick  
Railway switch. Street..... W. J. Bell  
Rake adjusting mechanism..... R. B. Macphail  
Reclining chair..... E. H. Fisher  
Red azo lake..... R. Gley et al  
Refrigerating apparatus..... J. F. Place  
Register..... H. E. Goldberg  
Relay..... W. W. Dean  
Rheostat. Electric..... 2 pats..... L. Wilson  
Ribbon or roll holder..... G. C. Farrar  
Roasting furnace with a swimming hearth..... R. von Zelewski  
Rotary engine..... H. M. Dailey  
Rotary engine..... H. A. Mattill  
Rotary engine..... H. Mullen  
Rotary engine..... J. W. Larimore  
Rotary engine..... E. A. Morpheus  
Rotary engine..... L. S. Flatow  
Rotary engine..... W. F. Barrett  
Rubber. Refining crude..... W. A. Lawrence  
Rubber without solvents. Extracting..... W. A. Lawrence

Saddletree. Harness..... D. C. Bowers  
Sate. Door jamb..... W. R. Park  
Sash and frame. Combination top and bottom window..... J. Moss  
Sash dovetailing machine. Window N. Barrett  
Sash. Window..... E. Wadey  
Saw table..... F. D. Hazeltin  
Sawing machine. Drag..... D. J. Shea  
Scale. Railway track..... J. A. Barclay  
Scoop..... M. Voelker  
Seal for bottles, &c..... G. A. Kendall  
Sealing device..... W. E. Heath  
Seal post..... A. Rydquist  
Sensitive sheets. Device for holding flexible..... R. Beckmann  
Separator..... J. Tetlow  
Serving apparatus..... R. Taylor  
Sewing machine..... M. Hemlebe  
Sewing machine. Buttonhole..... J. T. Hogan  
Sewing machine stitch forming mechanism. Book..... H. Hastings  
Shade adjuster, lock and pull. Combined..... S. R. Smith et al  
Shade fixture. Adjustable window M. E. Rice  
Shaft. Counterbalanced crank..... A. R. Mosler  
Shaft. Flexible..... S. M. Rurdick  
Shears or the like..... F. D. Davies  
Sheet metal ware. Making..... J. Kirschbaum  
Sheeting driver..... D. D. McBean  
Ships' hulls, &c. Apparatus for cleaning and treating..... H. Binney  
Shoe antislipping device..... C. Cook  
Shoe tip..... C. C. Turner  
Shoestring retaining device..... J. W. Force  
Silo..... A. O. Hubbard  
Siphon..... C. H. Linn  
Skate..... J. Thomson et al  
Skins and hides. Apparatus for treating..... R. D. Scott  
Slab or plate..... W. L. Kann  
Slack take up and adjuster. Cord..... F. W. A. Meyer  
Sleeve protector..... A. G. Haynes  
Slitting machine..... H. L. Staley  
Smoke preventing furnace..... A. W. Puddington  
Smoke preventing furnace..... W. A. Koneman  
Snap hook..... R. F. Covert  
Soda acetate. Making..... W. M. Grosvenor  
Soldering machine. Can..... W. Cameron  
Sound records. Removing..... B. Klepper  
Sound recording machine..... E. R. Johnson  
Speed mechanism. Variable..... R. Lang  
Speed regulator..... T. & C. T. Nesom  
Spinning apparatus. Yarn..... J. Booth  
Spring clip..... G. W. McGill  
Spring motor..... E. L. Garvey  
Stacker. Straw..... F. L. Sattley  
Stamp for indorsing, &c. Hand..... E. J. Mankiewicz  
Steam boiler..... R. W. Barton  
Steam boiler..... B. H. Green  
Steam boiler..... J. M. McClellon  
Steam boiler..... J. B. Beam  
Steam generator..... E. Makin, Jr  
Steam or similar engine..... E. Thomson  
Steam trap..... J. H. Blessing  
Steering mechanism..... F. T. Cable  
Stoker for threshing or other engines..... D. Farquhar et al  
Stone dressing machine..... A. F. Jones  
Stone for imitating embroidery..... G. Keller  
Stone post. Artificial..... E. H. Dresser  
Stone tub. Artificial..... F. Jager  
Storage battery..... C. W. Kennedy  
Stove..... S. Bredahl  
Stove. Lamp..... R. M. Bracklow  
Strap spring attachment..... W. J. Davidson  
Stump extractor..... J. C. Fullington  
Sugar boiler..... T. W. Lanier  
Suspenders. Boy's..... C. I. Mandel  
Switch..... A. M. Beall  
Switch. Quick action make and break..... W. C. O'Brien  
Switch throwing mechanism..... N. J. Anderson  
Tag clip..... F. E. Ladd  
Tag holder and lock. Shipping..... C. M. Alger  
Talking machine..... M. A. Possos  
Talking machine turn table..... E. R. Johnson  
Tar bark. Apparatus for the removal and dumping of spent..... H. Braniff  
Target..... O. Hanson  
Telephone..... C. B. Smith  
Telephone system..... 3 pats..... C. B. Smith  
Telephone transmitter and receiver. Combined..... C. Yeack  
Telephone trunk line apparatus..... W. W. Dean  
Telephones, &c. Folding bracket for..... S. J. Seifried  
Testing machine. Coin controlled S. M. Taylor  
Thread dressing machine spindle driving device..... G. A. Fredenburgh  
Threshing machine..... E. D. Huist  
Tile machine..... W. A. Strouss et al  
Tobacco lath..... I. C. Putnam  
Tool. Pneumatic..... N. W. Fletcher  
Toy..... W. M. Moseley  
Toy for expanding the lungs..... O. Henrichsen  
Track instrument. Electrical..... T. Fogel  
Track sanding device..... M. A. De France  
Trap..... M. Hartmann  
Trolley..... A. B. Upham  
Trousers fly fronts. Fastening device for..... F. M. Schmidt  
Truck. Car..... W. J. Knox  
Tube drawing mechanism. Seamless..... P. Patterson  
Tug. Shaft..... A. J. Dewald  
Turbine governing mechanism..... J. Wilkinson  
Turbine. Steam..... E. C. Ferry  
Turbine. Steam..... P. J. Hedlund  
Twine holder..... A. J. Seckner  
Twisting machine thread retaining bar..... W. A. Mackie  
Urinal. Sanitary..... J. Seidel  
Valve..... L. W. Neubling  
Valve and igniting gear for explosive or internal combustion engines 2 pats F. M. Rites  
Valve. Float operated..... J. W. Kedington  
Valve for hydraulic air compressors..... J. C. Schneider  
Valve gear for explosive or internal combustion engines..... F. M. Rites  
Valve indicator..... E. F. Osborne  
Valve. Supply..... W. T. Nichols  
Vault. Burial..... C. F. Surface  
Vault light construction..... W. L. Caldwell  
Vehicle jack..... E. H. Ryan  
Vehicle. Motor road..... E. H. Meden  
Vehicle seat. Adjustable..... T. H. Smith  
Vehicle storm curtain..... B. S. D. S. Martin  
Vehicle wheel..... A. Turkington

Vending machine. Coin operated J. B. Fender  
Vessel. Marine..... C. H. Lee  
Veterinary dental float..... J. R. Mahaffy  
Wagon top..... C. E. Parish  
Wash tub..... G. Loeb, Jr  
Washing machine..... L. E. Pollard  
Watch alarm receptacle..... R. B. Hemming  
Watch. Stem winding and setting..... J. M. Bachner  
Water meter..... 4 pats..... F. Lambert  
Water purifier. Electrolytic..... G. W. Frazier  
Water stopper. Masonry..... D. D. McBean  
Waterer. Stock..... F. S. Seymour  
Wave motor..... W. L. Walter  
Weather strip. Window sash..... J. F. Schupp  
Weighing machine. Coin controlled..... S. Williamson  
Well drill..... M. M. Long  
Wheel fender..... C. H. E. Schenck  
Wheel rim. Vehicle..... H. Harris  
Wind power. Mechanism for utilizing..... T. R. Timby  
Windmill..... T. W. Lowe  
Windmill motion changing gear..... J. Alston  
Window..... F. J. & H. G. Carl  
Window and screen. Combined..... P. M. Barnes  
Window. Casement..... H. C. Smith  
Wire connector..... E. P. Enler et al  
Wire fabric..... V. Hoxie et al  
Wire splice and producing same..... C. M. Lamb  
Wire suspending device..... H. E. Stevens et al  
Woodworking machine gaging and counting attachment..... H. O. Fry  
Wrench..... J. J. A. Mider  
Yoke. Neck..... H. C. F. Loptien

## DESIGNS.

Brooch or similar article..... F. M. Welch  
Candelabrum..... A. C. Miller  
Radiator..... E. P. Waggoner  
Rein guide..... J. W. Brooker  
Spoons, forks, or similar articles. Handle for..... E. Crees et al

Issued October 20, 1903.

## MECHANICAL PATENTS.

Accumulator..... W. K. L. Dickson  
Acid. Making acetic..... J. G. & A. Behrens, Jr  
Air and gas mixer..... F. J. Moehn  
Alkaline salts. Electrolytic decomposition of..... M. Wildermann  
Amusement wheel..... F. T. Harlan  
Antikicking device and shield..... C. Jacobson  
Apron..... E. W. Peterson  
Armature for electric motors and generators..... C. D. Knight  
Automatic switch..... M. D. Van Why  
Axle lubricator. Car..... P. T. Langdon  
Axle or shaft marker..... O. Sovejus  
Bag turning machine..... S. M. Philbrick et al  
Baling press..... A. C. Roberts et al  
Ballot box..... M. L. Cram  
Barge..... G. E. Titcomb  
Bark from logs. Machine for removing..... W. W. & F. N. Trevor  
Bean separating machine..... E. Burnett et al  
Bearing. Fluid..... J. F. Cooley  
Beater adjusting or regulating device..... A. Castelin  
Beehive comb frame..... J. W. Brown  
Beet root cutter. Sully..... T. J. Hubbell  
Belt. Driving..... G. J. Booth  
Bicycle mud guard..... W. Beckwith  
Binder. Temporary..... P. Peugeot et al  
Blacking box foot rest..... L. E. Tucker  
Boiler..... O. Carnes et al  
Boiler flue joints. Flue expander for expanding..... W. E. Donehower et al  
Boot or shoe instep supporter..... G. N. Phelps  
Bottle. Non refillable..... A. A. Boschelli et al  
Bottle. Siphon..... S. C. Kindig et al  
Bottle. Siphon..... J. G. Heinrich  
Brake appliance. Fluid-pressure A. G. Luray  
Brick drying floor..... D. W. Anderson  
Bromin from brine. Extracting..... H. H. Dow  
Brush attachment..... J. F. Spence  
Brush. Rotary..... F. G. Farham  
Brush. Tooth..... W. B. Ryder et al  
Buckle..... E. J. Kraetzer  
Building block and wall..... F. E. Kidder  
Building blocks. Kindergarten E. B. Woodson  
Burglar alarm. Electric..... B. F. Schubert  
Bushing and bung. Bung..... S. Schlangen  
Button or hook. Collar..... J. W. Tinch  
Cabinet. Wall..... J. M. Decker  
Calculating machine..... H. E. Goldberg  
Calendar..... reissue..... F. C. W. Stelter  
Camera..... H. G. Mutschler  
Camera adjustable focusing stop A. Mutschler  
Camera back..... C. E. Hutchings  
Can filling apparatus..... W. B. Hodges  
Can heading machine..... A. P. Wolfe  
Can making machine..... W. D. Brooks  
Candelabrum..... X. B. Konkel  
Cane and umbrella or parasol. Combined..... R. Kroneberg  
Capstan. Electric..... W. D. Baldwin et al  
Car attachment for shipping hogs in hot weather. Stock..... M. C. Beck  
Car brake..... E. E. Brown et al  
Car coupling..... J. Kelso  
Car door fastening..... F. C. Anderson  
Car heater. Electric..... E. M. Herr  
Car platform gate..... F. Dix  
Car stake pocket..... J. F. McKechnie  
Car underframe. Railway..... H. R. Keithley  
Cars. Loading..... S. K. Smith  
Carburetor regulator. Explosive engine..... J. Gronvelle et al  
Carriage. Cableway..... J. G. Crowdes  
Carriage. Child's..... E. S. Tillinghast  
Cards. Playing..... J. W. Tavenner  
Cash register, indicator, and recorder..... J. Pfeifer  
Casting apparatus. Metal..... A. M. Acklin  
Casting metals..... A. M. Acklin  
Castings. Making metal..... W. A. Bole  
Centrifugal machine..... P. Boulanger  
Chain for conveyers, elevators, &c..... A. D. Swegle  
Chair foot rest..... C. F. Mundy  
Chatelaine pin..... N. F. Valentine  
Check or the like. Bank..... S. W. Finch  
Chuck. Nipple..... B. Borden  
Churn..... C. S. Fitzhugh  
Churn and egg beater..... C. Truelsen  
Chute. Conveyor..... G. F. Conner

Circuit controller..... A. Lungen  
Clay articles. Delivery table for green..... W. R. Waggoner  
Clock winding reminder..... J. C. Fisher  
Clothes stick..... H. Sarasin  
Clutch. Magnetic..... C. I. Earll  
Coating for metal structures. Antifouling..... G. D. Coleman  
Cock. Gage..... A. W. Cadman  
Coke conveyer. Hot..... M. Graham  
Coke drawer..... W. Kearns  
Coloring matter. Disazo..... E. Schleicher et al  
Concentrator..... E. Schutz  
Convertible chair..... W. D. & F. N. Russell  
Copy holder..... F. M. Durham et al  
Corn headin. attachment. Binder..... J. L. Williams et al  
Corn husker and shredder..... G. W. White  
Corner staying machine..... W. F. Morse  
Corset..... A. P. McGraw  
Cream separator and churn..... J. Klein  
Crop gater and loading machine..... J. A. Low  
Crushing rolls..... W. G. Dodd  
Cultivator..... J. H. Elward  
Cultivator draw bar adjusting device..... J. A. Smethers  
Currency holder..... F. E. Walker  
Curtain draping device..... E. J. Cook  
Curtain fixture..... H. W. Fosnaugh  
Cutter bar lining device..... J. Geiger  
Decorating. Transfer..... B. Walker  
Decoration..... J. D. Kyle et al  
Dental dam..... H. Craigie  
Denture. Artificial..... G. J. Davison  
Desk. Office..... R. Huddleston  
Disk cutter..... J. Brooks  
Display stand..... J. C. Hexom et al  
Dock. Floating..... O. H. Ehlers  
Door check and fastener..... A. Kalb et al  
Door check and lock. Combined..... A. Kalb et al  
Draft evenner..... B. Firebaugh  
Draft evenner..... C. La Dow  
Draft regulator. Automatic forced..... H. E. Parson  
Draft rigging..... H. C. Williamson et al  
Drawer guide..... J. J. Schaad  
Drying apparatus..... M. M. Graves  
Dynamo. Inclosing casing for the driving gear of car..... P. Kennedy  
Electric generators. Direct and alternating current reverse mechanism for..... O. Higgins  
Electric heater..... E. F. Porter  
Electric machine brush holder. Dynamo..... M. E. Thompson  
Electric switch. Push button..... W. C. Tiegoing  
Electric time controller..... F. W. Schneider  
Electrical controlling apparatus..... J. D. Ihlder  
Electroplating apparatus..... C. T. Pratt  
Elevating or hoisting apparatus..... G. C. Mackrow et al  
Elevator..... F. D. Potter  
Embossing machine..... J. Kirschbaum  
Embryotractor..... W. A. Hill  
Engine oil injector. Gas..... R. P. Thompson  
Engine reversing apparatus. Steam..... C. F. Saylor  
Engine sparkler. Gas..... J. A. McGee  
Engine speed regulator. Kerosene oil..... F. C. Hirsch  
Engine vaporizer. Hydrocarbon V. J. Emery  
Engines. Constant level liquid hydrocarbon vaporizers for oil..... C. M. Mohler  
Engraved plate wiper..... F. E. Blaisdell  
Exercising device..... C. H. Hershheim  
Expansion bolt..... N. H. Steward  
Explosive engine..... W. J. Wright  
Explosive motor..... H. Spuhl  
Extension table..... H. Johnson  
Extension table..... G. C. Calentine  
Eyeglass nose clip..... F. G. Schmidt  
Eyeglasses..... H. E. Bouschur  
Fabric marking apparatus..... D. Anderson  
Fabrics. Machine for shaking out and opening textile..... D. Welsh  
Farm gate..... S. Purvine  
Felly compressing and boring machine..... G. A. Ensign  
Fence..... H. Frey  
Fence post..... W. R. Bordner  
Fence. Wire..... J. Kaufman  
Fertilizer distributor..... J. A. Neese  
File and index. Paper..... T. J. Johnson  
Finger nail trimmer..... J. Petrelli  
Firearm safety lock..... M. V. B. Allen  
Fireproof construction..... C. H. Scammell  
Fireproof partitions. Constructing..... W. C. Lyon et al  
Fireproof rolling partition..... W. McWorkman  
Fish hook..... J. T. Henderson et al  
Fish hook holder..... E. W. Kurtz, Sr  
Fishing reel..... J. vom Hofe  
Flask clamp..... I. R. & L. A. Brown  
Flat iron. Gas heated..... G. M. Spangler  
Floor scraper. Hardwood..... O. B. Taylor  
Flour process and apparatus..... E. F. Clark  
Fluid controlling mechanism..... J. A. Tilden  
Fluid pressure engine..... M. N. Forney  
Flush tank supply system..... J. W. Nethery  
Fly catcher. Liquid..... R. Schmidt  
Folding chair..... J. H. Stiggleman  
Fruit sorting and distributing apparatus..... C. Rayburn  
Fuel for heating railway freight cars, warehouses, &c..... R. J. Shimper  
Furnace..... C. J. Shumfort  
Furnace ash pit. Locomotive..... H. E. Parson  
Furnace combustion regulator. Locomotive..... H. E. Parson  
Fuses of cartridges, &c. Means for setting the time..... C. Rostef  
Game apparatus..... R. H. Smith  
Game counter..... E. Sommers  
Gas engine..... R. P. Thompson et al  
Gas fixture fitting. Incandescent J. Hutchinson  
Gas generator. Acetylene..... G. H. Davis  
Gas lighting apparatus. Automatic..... B. W. Harris  
Gasoline engine..... O. E. Pehrsson  
Gear. Variable speed..... R. P. B. Green  
Gear with adjustable stroke. Reversible..... O. Caracciola  
Gears. Shaft connecting device for change..... A. M. Harrison  
Gearing..... C. L. Haase, Jr  
Gelatin. Manufacturing vegetable..... A. L. Martin  
Glass batch. Handling..... A. M. Acklin  
Glass. Manufacturing..... J. Hirst  
Glass manufacturing apparatus..... J. Hirst  
Glass tube contracting machine..... W. N. Packer



Goggle. Strabismus..... J. E. Stierle  
Golf club..... W. C. Carnegie  
Governor valve gear for explosive and internal combustion engines..... F. M. Rites  
Grading machine. Road..... H. K. Clemons  
Grain separator..... E. B. Millard  
Grain sorter or separator..... F. L. Block  
Grain steaming apparatus..... P. Provost  
Graphic processes. Developing, recording, or transmitting..... G. B. Rossman  
Grater. Vegetable..... F. L. Fahrholz  
Grinder. Knife..... J. W. Latimer  
Grinding or polishing machine. Automatic..... A. H. Hatfield  
Growth. Regulating..... E. E. Risien  
Grubbing machine. Sage brush..... A. Rowan  
Gun sight..... W. L. Marble  
Hair confiner..... A. B. Wood  
Halter..... G. N. Barcus  
Halter..... L. Spencer  
Harvester or mower sickle knife..... J. W. Evans  
Harvesting machine. Sidehill..... D. Best  
Hay press..... J. L. Orr  
Head or search light reflector..... H. H. Taylor  
Headlight signaling apparatus. Locomotive..... W. S. Blackburn  
Headlights. Gas jet holder attachment for lamps of locomotive..... E. B. Stoner  
Heat regulator..... L. Aldrich et al  
Heddle bars or supports. Clamping device for..... H. W. Jordan  
Heel lift cutting machine..... N. W. Friis  
High temperature furnace..... J. T. Shacforth  
Hinge. Spring..... O. M. Chesney  
Hopper. Cow..... J. H. Miller  
Horseshoe calk..... H. R. Fox  
Hose rack..... J. F. Muldoon  
Hose supporter..... W. C. Michael  
Hot air furnace..... T. F. Meinhardt  
Hot air furnace..... F. J. Pioch  
Hydrocarbon burner..... H. P. Roberts  
Hydrocarbon burner..... R. M. Jackson  
Ignition plug. Jump spark..... J. H. Lehman  
Incubator hot water heating system..... M. M. Johnson  
Indicating device..... W. R. Thompson  
Indicating system and time beater..... W. Stanley  
Ink..... H. H. Spohn  
Insulating fixture stud..... A. C. Prouditt  
Insulators to their supports. Device for attaching..... N. F. Anderson et al  
Irrigation. Water lift for..... G. A. Croft  
Jail alarm. Electric..... R. F. Adams  
Jar closure..... W. D. Keefer  
Journal bearing..... W. P. Arntz  
Ladder. Step..... J. A. Ashley  
Lamp bulbs. Blow off for incandescent..... W. N. Packer  
Lamp. Incandescent vapor..... L. Denayrouze  
Lamps. Means for the attachment of incandescent..... W. C. Tregoning  
Lampblack. Making..... R. A. Sembdner  
Lamp socket. Electric..... W. Norden  
Latch..... M. Cossey  
Lead, silver, or zinc ores. Treating..... S. Ganelin  
Leather stretching machine..... F. F. Williams  
Leaves from their stems. Apparatus for separating the lateral portions of..... L. P. Whitaker  
Leg. Artificial..... C. E. Stone  
Level. Spirit..... J. Lemle  
Level. Spirit..... G. L. Davis  
Lid fastener..... J. F. Fields  
Lifting jack..... G. Stockamp  
Lifting jack..... J. J. McFerrin  
Light controller. Time..... E. Newman  
Lin type machine..... P. T. Dodge  
Lock..... F. W. Lindgren  
Lock..... C. E. Duggan  
Lock..... S. Nelson et al  
Lock washer..... W. C. Mattesoa  
Locking device for wrenches, clamps, &c..... J. P. Ray  
Locomotive..... H. E. Parson  
Locomotive exhaust mechanism..... F. O. Wheel  
Loom. Filling replenishing..... J. North op  
Loom. Filling replenishing..... A. E. Rhoades  
Loom for weaving short wefts..... W. Wattie  
Loom let off mechanism..... W. Haynes  
Loom warp stop motion..... W. H. Baker et al  
Mail box. Rural..... B. B. Williams  
Mail transportation system..... T. W. Russell  
Marking instrument..... F. Moehle  
Matches from plates. Machine for punching..... W. E. Williams  
Measuring device. Fluid..... A. W. Southey  
Measuring irregular objects. Device for..... G. E. Bright  
Merry-go-round..... M. E. Logan  
Metal feed mechanism..... F. E. Vandercok  
Meta's by the use of chlorine. Extracting the heavy..... J. A. Savelsberg  
Meter..... J. A. Tilden  
Marble or granite polishing machine head..... H. J. Higgins  
Mat..... G. S. Gethen  
Miner's blasting squib..... T. R. Jones  
Molding material..... P. Wurtz  
Motor control..... J. D. Ihlder  
Mouse or rat trap..... A. Schicklering  
Mower..... S. W. Johnson  
Mower attachment..... L. Clark  
Mowing machine..... J. W. Rarnes  
Musical instrument key system..... A. Tschofen  
Mustache curler..... J. Phelan et al  
Necktie holder..... J. F. Page  
Non arcing clamp..... H. L. Fritze  
Nozzle..... H. B. Sherman  
Numbering machine..... A. Nordstrom  
Nut and bolt lock..... H. E. Owen et al  
Nut lock..... J. O'Connor  
Nut lock..... M. I. Waiz  
Nut lock..... H. B. Smith  
Nut setting and bolt trimming machine..... J. W. Waldorf  
Oil burner..... A. J. O'Brien  
Oil burner..... G. E. Witt  
Oil burner..... E. B. Raymond  
Oil distributing apparatus..... T. F. White  
Ores. Treating refinery..... E. C. Pohle et al  
Organ pneumatic action and coupler..... F. Campkin  
Ornamenting articles. Device for..... J. Kirschbaum  
Oven..... G. Ott  
Oven. Baker's..... G. S. Baker  
Oven. Baker's..... W. D. Muir  
Overflow alarm..... W. J. Bishop  
Packaging machine..... G. R. Ward  
Packing..... E. G. Miner  
Packing case for tumblers, bottles, &c..... J. N. Hahn

Packing ring. Piston..... T. Officer  
Paper holder. Toilet..... J. J. Tierney  
Paper making machines. Water extractor for..... R. M. Scanlan  
Paper roll support..... W. A. Wheeler  
Paper weight, receptacle, and pincushion. Combined..... S. T. Buckham  
Pen. Fountain..... E. J. Kastner  
Pencil sharpener..... O. B. Welker  
Permutation lock for valises, &c..... N. S. Ebert  
Pictures. Protecting dry color..... G. W. Brown  
Pipe coupling. Automatic..... N. F. Niederlander  
Pipe jack..... L. C. Beard et al  
Plow point. Reversible..... T. J. Hubbell  
Plumb, rule, and level. Combination for doing..... H. F. White  
Popcorn popper..... H. R. Estes  
Postal boxes. Self-closing and changeable case for..... P. Schulze  
Postmarking and canceling machine..... J. French  
Printing on roll paper. Apparatus for..... A. E. Palmer  
Projectile..... H. E. Thomas  
Pulley..... G. F. Conner  
Pulley for metallic window frames..... W. D. Watson  
Pulley. Grip..... S. R. Batson  
Pump..... G. F. Conner  
Pump..... S. B. Jones  
Pump..... C. R. Moore  
Pump..... C. L. Parker  
Pump. Deep well..... H. A. Bower  
Pumping apparatus..... C. L. Cushing  
Push button..... E. W. Ham  
Puzzle..... M. J. Cawley  
Puzzle..... Z. B. Webb  
Radiator for heating buildings..... D. Sinclair  
Rail conductor. Third..... F. T. Bailey et al  
Railway. Electric..... F. W. Rochler  
Railway gate..... J. H. Elward  
Railway rail..... G. R. Huff  
Rail way rail joint..... J. G. McMichael  
Railway signal. Electric..... H. Brooks  
Railway switch..... A. L. Eddy  
Railway switch operating mechanism..... G. W. Fernside  
Railway switch operating mechanism..... H. D. Stelle  
Railways. Electric signaling system for..... A. J. Derr  
Rakes. Manufacturing..... W. R. Jenkins  
Range finder..... J. W. Kern  
Reaper reel rake..... C. A. A. Rand  
Reducing furnace..... W. W. Fyfe  
Refrigerating and purifying apparatus..... C. W. Vollmann  
Refrigerator..... A. D. Fritts  
Refrigerators, &c. Lining for..... P. Schreck  
Rein holder..... J. G. Bowles  
Renovating apparatus..... J. S. Thurman  
Rheostat. Automatic..... J. W. Moore  
Rheostat. Automatic..... A. B. Saliger  
Riding habit..... A. Loscalzo  
Rimming machine..... F. Unckrich  
Rolling mill..... J. W. Offutt  
Rolling sheet metal. Pack for..... A. Paterson  
Rotary engine..... H. W. Bogart  
Roundabout..... C. P. Beisel  
Rowlock..... J. R. Supple  
Rule for checks, &c. Severing..... S. W. Finch  
Ruler. Flexible..... E. A. Dunn  
Sash lock..... R. W. Hutchison  
Sash. Window..... S. Grady  
Sawing machine..... G. Kundmueller  
Scale..... J. H. Milburn  
Scale. Vertical stoker..... P. B. Clarke  
Scales. Balancing and recording mechanism for weighing..... H. O. Hem  
Scoop..... L. Ernst  
Screening machine..... G. W. Osburn  
Scrubbing machine..... F. Gossack  
Seal. Car..... H. Thompson  
Sealing device. Automatic envelop..... L. Madas  
Sealing device. Bottle or jar..... 2 pats..... E. D. Schmitt  
Seaming machine. Can double..... C. Stecher  
Seed stirring mechanism..... W. Feizer  
Sewing machine hemmer..... A. Laubscher  
Shade roller spear..... W. D. Jones  
Shell supporter..... F. L. Collis  
Shoe. Electric..... J. S. Busky, Jr  
Shoestring tip..... R. M. Seibel  
Shredding machine..... M. F. Williams  
Shuttle guard..... A. Aube  
Sickle bar..... B. F. Stuart  
Sifter. Ash..... T. McGowan  
Sign. Revolving..... G. W. De Camp  
Signaling. Coherer for wireless..... T. E. Clark  
Sink trap..... C. E. Morrison  
Smoke bell..... H. E. Butler  
Soap feeding receptacle. Liquid..... G. A. Schmidt, Jr  
Speed changing device..... N. Lombard  
Speed driving mechanism. Variable..... A. Herbert et al  
Speed regulator..... H. E. Warren  
Spinning apparatus. Ring..... G. O. Draper  
Spinning spindles..... J. C. Edwards  
Spooling machine thread guide..... L. T. Houghton  
Spraying or ejecting apparatus. Oil or liquid..... E. Castle  
Spring structure..... E. A. Hofer  
Spring wheel..... E. D. Johnson  
Stacker. Straw..... M. Heineke  
Stamp mill..... G. Thompson  
Station indicator..... 2 pats..... P. I. Fyfe  
Steam boiler..... J. W. East  
Steam engine..... C. E. Van Norman  
Steam engine. Compound..... J. E. Sague  
Sterilized substances. Closure for vessels for..... J. K. Vander Heide  
Sterilizing apparatus..... G. Van Eyck  
Stone blocks. Device for making artificial..... H. G. Goodwin  
Stove..... M. Hertenstein  
Stove..... J. Wood  
Stove. Car heating..... R. D. Grant et al  
Stove. Hot blast..... H. Lang  
Stove lid lifter..... J. F. Rose  
Stove lighting attachment. Gas L. E. Adams  
Stovepipe fastener..... A. J. Forsythe  
Stove. Vapor..... I. Kenney  
Strength testing or punching machine..... R. J. Carson  
Stud member..... J. V. Washburne  
Sugar making..... 2 pats..... M. H. Miller  
Suiky..... F. Rudolph  
Switch indicating mechanism. Snap.....

Tablet. Writing..... C. G. Perkins  
Tailor's cloth cutter. Custom..... P. E. Salin  
Tanning, bleaching, scouring, and oiling leather. Apparatus for continuously..... W. T. Forbes  
Telegraph Geometric..... G. B. Rossman  
Telegraphy. System of wireless..... S. G. Brown  
Telephone substation apparatus..... H. F. Farwell  
Telephone switchboard circuits and apparatus..... S. B. Prentiss  
Telephone system..... D. F. Stakes  
Telephone system. Central energy..... K. B. Miller  
Tentering machine..... A. A. Whitley  
Testing machine..... T. Olsen  
Threshing machine..... F. T. Parkhurst  
Ticket of varied value..... G. T. Murray  
Ticket Transportation..... A. A. Anderson  
Timber clamp. Cross..... W. Loudon  
Tire armor. Pneumatic..... E. C. Radick  
Tire joint closing machine. Rubber..... F. H. Guber  
Tire remover..... H. L. Doane  
Toaster..... C. A. Roseland  
Tongs. Fire..... L. McKinniss  
Torch regulating apparatus..... J. N. MacDowell  
Torch..... R. Thayer  
Torpedoes. Gyroscopic apparatus for steering..... F. M. Leavitt  
Toy..... E. A. Sanguinet  
Toy..... E. S. Hale  
Toy..... H. Johnson  
Toy. Optical..... P. D. Smith  
Toy or game apparatus. Educational..... E. Gates  
Toy railway rolling stock..... A. Schutze  
Track fastening..... L. Sweeney  
Traction wheel or runner..... A. Sell  
Train signaling and controlling system..... H. O. Westmark  
Trolley stand..... J. J. Goodrich et al  
Trousers stretcher..... S. Gasser  
Truck. Car..... F. W. Luedke  
Truss. Hernial..... W. S. Rice  
Tug hook..... A. Anderson  
Tunnel boring machinery..... J. Price  
Turbine. Compound steam..... W. E. Shepard  
Turbines. Means for improving the efficiency of..... A. R. Dodge  
Turbines. Support for intermediate buckets in..... A. R. Dodge  
Type writing machine..... E. Thurey  
Umbrella..... B. R. Myers et al  
Umbrella and cane rack..... C. J. Monfort  
Umbrella stick..... J. Rose  
Unloading apparatus..... C. P. Martin  
Vaccine tube..... W. H. Chandler

Valve..... J. Erwood  
Valve. Cylinder relief..... C. L. Presnell  
Valve gear. Explosive engine..... G. W. Starr et al  
Valve gear for explosive and internal combustion engines..... F. M. Rites  
Valve mechanism. Gas engine..... W. J. Wright  
Vaporizer..... G. Beaumont  
Vault cover..... G. W. Shade et al  
Vaults. Means for excluding dampness from..... H. L. Kubberuss  
Vehicle body..... W. G. Dorland  
Vehicle controlling device. Motor..... J. Sachs  
Vehicle. Motor..... A. W. Sandell  
Vehicle spring..... J. Cummings  
Vending cabinet..... J. M. Shelton  
Vending machine..... J. B. Hurd  
Vending machine..... F. F. Pulver  
Vessel loading or unloading apparatus..... B. J. Harris  
Vise. Bench..... J. R. Long  
Wagon jack and end gate..... W. R. Buchanan  
Washboard..... M. Ziemelman  
Watch holder..... R. K. Hohmann et al  
Water closet..... P. J. Madden  
Water closet..... A. Ek  
Water gage..... W. R. Malcolm  
Water lifts. Continuous power chain of..... G. A. Croft  
Water motor..... J. W. Brooks  
Water purifier..... O. M. R. Moller  
Weaver. Calf..... C. B. Wagner, Jr  
Weighing device. Automatic electric..... N. Newman  
Well rigs. Casing or drive pipe screw for..... R. S. Oiler  
Wheel..... D. Best  
Windmill..... L. C. Hamel  
Window fastener..... W. D. Watson  
Window fastener. Storm..... F. D. Rumford  
Windows. Device for opening swinging..... M. Prior  
Wire weaving loom..... I. J. Neracher  
Wrench..... H. Scheffer  
Wrench..... A. P. Hartzell  
Wrench..... L. Coes  
Wrench..... J. Litschey  
Wringer..... S. Ondrey  
Yoke. Neck..... A. S. Lewis

## DESIGNS.

Chair bar rest. Morris..... E. A. Gay  
Electric light fixture..... 2 pats H. G. Willard  
Go cart body..... M. B. Lloyd  
Lamp shade..... G. W. Blair  
Lavatory..... 2 pats..... W. C. Peet  
Piano case..... G. Brunninghausen  
Store..... T. R. Kennedy et al

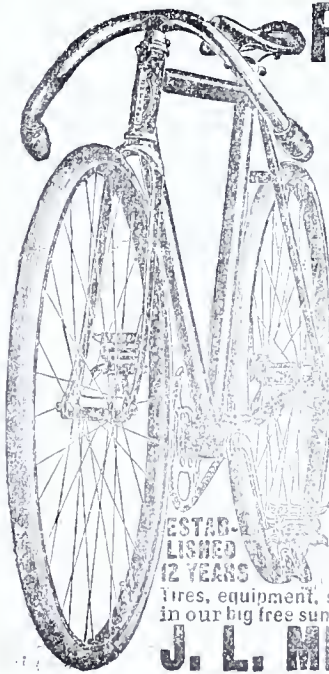
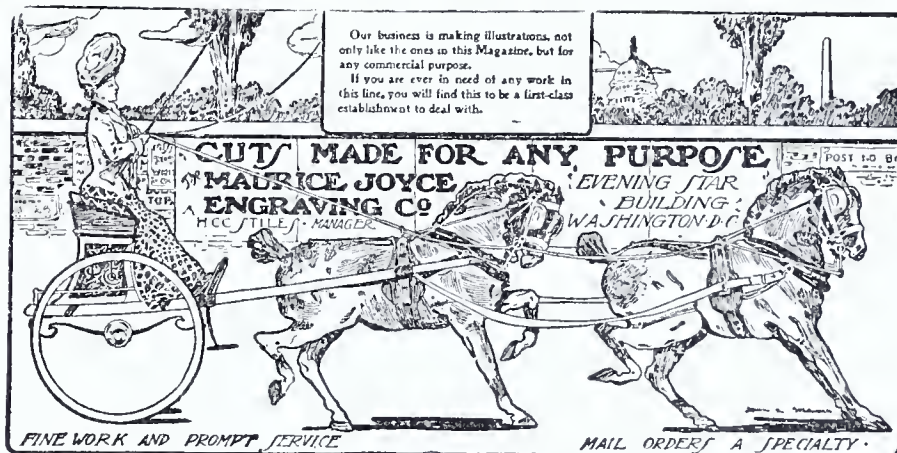
## Magic Rheumatic Cure!

It absolutely does cure. It is not a cheap remedy but it is a **cheap** cure. Mark the distinction! There are a thousand remedies to one cure. This is a **CURE**. It costs \$2.00 a bottle, and is worth \$20.00 to any sufferer. Sold only by our authorized agents or direct of us. Send for circular. Agents wanted.

## MAGIC CURE CO.

R. 313-315 Dearborn St.

Chicago.



## RIDER AGENTS WANTED

in each town to take orders for our new High Grade Guaranteed Bicycles.

## New 1903 Models

"Bellise," Complete \$8.75  
"Cossack," Guaranteed High Grade \$10.75  
"Siberian," A Beauty \$12.75  
"Neudorf," Road Racer \$14.75

no better bicycle at any price.

Any other make or model you want at one-third usual price. Choice of any standard tires and best equipment on all our bicycles. Strongest guarantee.

We **SHIP ON APPROVAL** C. O. D. to any one without a cent deposit and allow **10 DAYS FREE TRIAL** before purchase is binding.

**500 Second Hand Wheels \$3 to \$8** taken in trade by our Chicago retail stores, all makes and models, good as new.

**DO NOT BUY** a bicycle until you have written for our **FACTORY PRICES AND FREE TRIAL OFFER.** Tires, equipment, sundries and sporting goods of all kinds, at half regular price, in our big free sundry catalog. Contains a world of useful information. Write for it.

**J. L. MEAD CYCLE CO., Chicago, Ill.**



# A Useful Christmas Present.

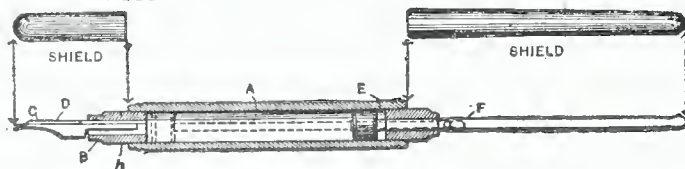


## The "POST" SELF FILLING FOUNTAIN PEN.

No Filler. No Soiled Fingers. No Lost Time. Simple and Perfect.

### THIS IS ITS CONSTRUCTION

IT IS AWAY AHEAD OF ANY OTHER PEN MANUFACTURED BECAUSE OF ITS SELF-FILLING AND SELF-CLEANING FEATURES.



BEING THE ONLY ONE MANUFACTURED HAVING THESE CONVENIENCES.

We will send this famous pen, postpaid, and one years subscription to "The Inventive Age," for \$2.00.

Every Inventor in the country needs The Inventive Age, and everyone needs a pen. Here's your chance to get a bargain.

There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the "Post" has secured. We have testimonials that a million dollars could not buy. In the list will be found leading men in politics, finance, law, religious movements, literary men, bankers and business men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the "Post" and in terms of praise simply unqualified. Send for list of testimonials.

Address:

**THE INVENTIVE AGE Publishing Co.**

918 F St. Northwest,  
Washington, D. C.

### Our Great Popular Offer!

...A...

## Complete Electrical Library

By PROF. T. O'CONOR SLOANE.

...A...

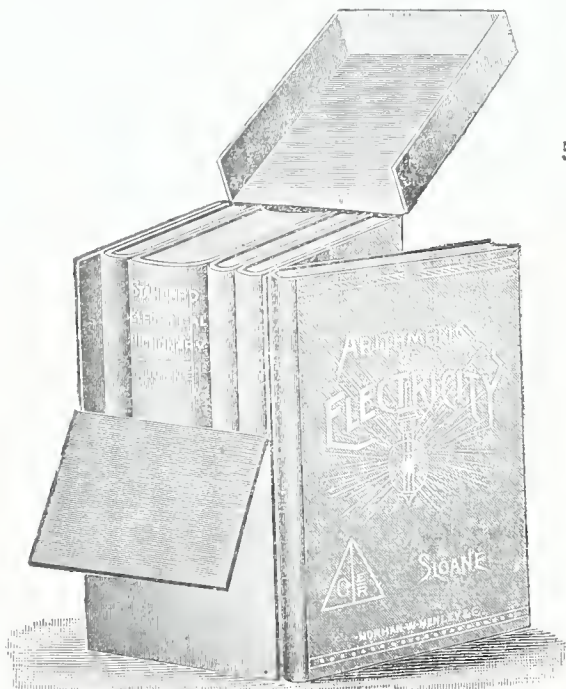
\$7.00

Library

for

\$5.50.

Comprised by  
the following  
books:



5 Volumes,

1300 Pages,

Over 450

Illustrations.

Electricity Simplified..... Price 1.00  
Arithmetic of Electricity..... " 1.00  
Electric Toy Making..... " 1.00  
How to Become a Successful  
Electrician..... " 1.00  
The Standard Electrical Dict'y 3.00

Our Great Special Offer.—We will send prepaid, the above five volumes, handsomely bound in blue cloth, with silver lettering, and enclosed in a neat folding box, as shown in the illustration, at the Special Reduced Price of \$5.50 for the complete set. The regular price of the five volumes is \$7.00

Order direct from us while the opportunity lasts. Any of the above books sold singly at the published prices. You save \$1.50 by ordering the complete set from us. Sent prepaid on receipt of price. Remit by draft, postal money order, or express order.

Address:

**THE INVENTIVE AGE Pub. Co.,**

918 F Street, N. W.,  
Washington, D. C.

## MECHANICAL MOVEMENTS, Powers, Devices and Appliances:

By Gardner T. Hiscox, M. E. Price \$3.00.  
Author of "Gas, Gasoline and Oil Engines."

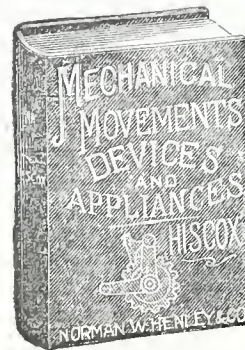
Large 8vo.

Over 400

Pages

Handsomely

Bound in Cloth.



1,649 Specially  
Made

Illustrations

With Descrip-  
tive Text.

PRICE, \$3.00

A **DICTIONARY** of Mechanical Movements, Powers, Devices, and Appliances, embracing an illustrated description of the greatest variety of mechanical movements and devices in any language. A new work on illustrated mechanics, mechanical movements, devices, and appliances, covering nearly the whole range of the practical and inventive field, for the use of Machinists, Mechanics, Inventors, Engineers, Draughtsmen, Students, and all others interested in any way in the devising and operation of mechanical works of any kind.

Sent to any address on receipt of price.

Address:

**INVENTIVE AGE Pub. Co.,**

918 F. St., N. W.,  
WASHINGTON, D. C.



A JOURNAL  
OF MANUFACTURING  
INDUSTRY

THE *Inventive Age* AND  
PATENT INDEX.

AND SCIENTIFIC PROGRESS.

FIFTEENTH YEAR,  
No. 12.

WASHINGTON, D. C.—DECEMBER, 1903.

SINGLE COPIES 10 CENTS.  
ONE DOLLAR A YEAR.

AFFAIRS IN COLOMBIA.



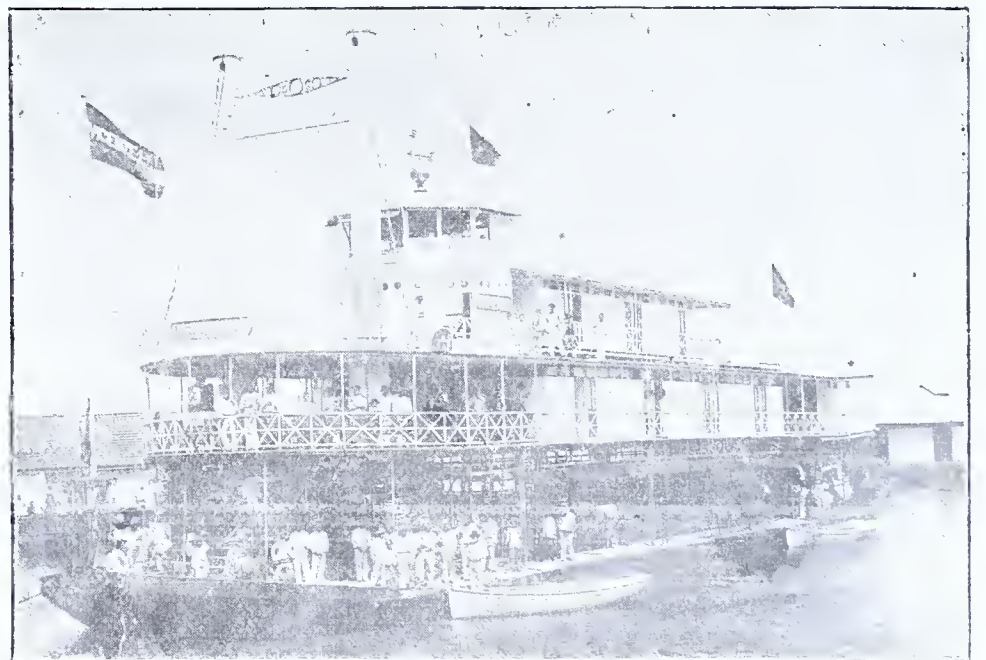
ESTABLISHMENT EL VERNILLO.



ESTABLISHMENT EL IMPULSO.



ESTABLISHMENT "LA INDUSTRIA."



MAGDALENA RIVER STEAMBOAT "VICENTO LAFAURIA."

THE extraordinary attitude adopted by the Republic of Colombia in trying to stem the tide of the world's progress, from motives of personal cupidity, has again focussed public attention upon that section of the globe, and renders of interest the following description of the country prepared for the INVENTIVE AGE by a traveler recently returned from the Republic.

Colombia has an area about equal to that of the States of Texas, New Mexico and Arizona combined, and a population estimated at 4,000,000, probably three-fourths of whom are Indian or mixed races. In that portion of the country in which the United States is most interested—the isthmus—the population is very sparse. Bogota, the capital—situated some 600 miles from Panama—has about 100,000 inhabitants, and is placed on a tableland 8,500

feet high. On the plateaus and mountain ranges the climate is temperate, but the valleys and the plains along the coast are hot, damp, and full of fever. There are less than 400 miles of railway in the country, including the forty-seven miles of the famous Panama line. The other railroads are short, varying in length from seventeen to sixty miles, and connecting cities with rivers on the coast. They are mostly controlled by American and English capital. The Panama line, it should be noted, was built originally by Americans; it took five years to construct, and most of the manual labor was performed by Chinamen. The great highway of commerce of the country is the Magdalena River, nearly 800 miles of which is navigable for steamboats. These are broad, flat-bottomed vessels, with stern wheels, and were mostly made in the United States, shipped



to Colombia in pieces, and put together at Barranquilla. The accompanying illustration on the front page shows one of these boats. It has a draft of about three feet, and burns wood as fuel. There are practically no wagon roads in the country, and freight and passengers are carried on mule back—sometimes over trails so steep and difficult that they would not be considered royal roads by a mountain goat.

The country is rich in mineral and agricultural resources, and yet, owing in part to the climate and in part to ignorance and want of capital, there has been but little development. Antioquia, the state or department adjoining Panama, is the Klondike of Colombia. Since the beginning of the seventeenth century, over \$250,000,000 worth of gold has been taken from this part of the country, although, owing to the lack of scientific methods, it is said that the deposits have been scarcely touched. The gold beds may still be regarded as virgin fields for enterprise, although the precious metal is found here, it is said, in greater abundance than almost anywhere in the world. To properly develop the mining industry of this state, all that is needed is the completion of a railway from the Magdalena river to Medellin, (the capital of the state of Antioquia) a distance of about fifty or sixty miles. Foreign capital—and not a little from the United States—has been invested in mines in Colombia within the past few years; but the civil wars, with their embargo on trade and their drafts upon the labor supply of the land, have prevented proper working. Silver, iron, copper, coal and marble are also found; and the emerald mines are the finest in the world. The most famous ones are near Bogota, and are called Muzo and Cosquez; they are owned by the Colombian government, which leases the right to exploit them for a term of years. The mines of Muzo have been worked since the sixteenth century. The mine is in the form of a tunnel 100 yards wide, with walls much inclined. Near the mouth are several large reservoirs, the water of which is controlled by a system of gates. The overlying barren rock is cut out in benches and falls to the bottom. When this begins to fill, the water is turned on and the rock swept away. This operation is repeated until the stone containing the gems—a bituminous limestone—is laid bare, when the emeralds are carefully broken out. About 300 Indians are employed to work the mines, and labor has been suspended for some time, owing to the revolution. An interesting item in connection with the mines is that the one known as Cosquez is a legend, and exists only on paper. It is regularly included in the contracts with the government, and much money has been spent to locate it, but thus far without avail. In 1665, it was declared to exist, and to be very rich; but it has since been lost, and its wealth of stones remains for rediscovery.

In agriculture, Colombia has equally valuable resources. Fortunes have been made in the cultivation of cacao,

coffee, rubber and other tropical products, but whoever may desire to undertake it must be prepared to endure sickness. The breath of malaria is in the parts of the country where these products thrive, and the skies blaze with everlasting heat. There are no changing seasons to break the enervating influence of perpetual summer, and to one bred in the temperate zone, the acclimatizing process is severe and trying. There are enormous areas of land in the southeastern part of the country, in the valley of the Orinoco, rich in soil and productions. Great levels stretch as far as the eye can see, a green ocean of tall and nutritious grass, watered by rivers that, in the rainy season, inundate the plains on either side for miles. Already vast herds of stock graze here, although but an infinitesimal part of what there might be. Farther south are mighty forests, untouched by man, abounding in all manner of valuable woods—vanilla, rubber, sarsaparilla, cinchona, mahogany, etc. Among others, there is a palm tree which produces a fibre excellently adapted for making ropes and cables. The fibre grows from the tree in the shape of a long beard—sometimes fully forty inches in length—looking like a mass of hair. As soon as it is cut off, another growth begins to take its place. This fibre is ready for use without any preparation whatever, and ropes made therefrom become stronger and more enduring when employed under water.

Many Americans have settled along the Magdalena river and the Pacific coast, and have devoted their energies to the cultivation of cacao, or cocoa, coffee and sugar. Two Americans, who have been living on the Magdalena for some ten years, have made large fortunes from cacao plantations. Millions of bananas are shipped yearly to the United States.

In spite of all the opportunities for enterprise, there is practically no manufacturing in Colombia. The industries consist in the production of sugar, molasses, cotton cloth of a coarse quality, straw hats, and some household utensils and necessities. The accompanying illustrations show some of these industrial establishments. Straw hats are practically the only things that are known in outside countries, and strange to say, the famous Panama straw hats are not made in Panama at all, nor to any extent in Colombia. They are manufactured for the most part in Ecuador, and took the name of Panama from the fact that that city was a distributing center. It may not be generally known that it is possible to work on these hats only at night. It is necessary to keep the straw damp during the process of manufacture, and it can be manipulated only while the atmosphere is humid—from about midnight to 7 A. M. It requires about 3 months to complete a hat, and the work requires patience, good sight and special skill; so the high prices demanded are not without their foundation in reason.

In view of the recent action of the Colombian Congress, it is interesting to examine the form of government. The president and vice-president are

chosen by an electoral college for a term of six years, and the president has almost unlimited power, as he is eligible to immediate re-election. There is a council of state of six members. Congress consists of a senate and house of representatives. There are 27 senators, chosen by the state legislatures, three from each of the nine states or departments, and one representative for every 50,000 inhabitants, about 60 in all. The suffrage is limited by property and educational qualifications. The state governors are appointed by the president, but the people elect the legislatures. The department of Panama was ruled directly by the national government, something like the District of Columbia. The present executive, Marroquin, entered upon his duties in July, 1900.

#### Food Adulteration in Europe.

An article on the adulteration of food products is going the rounds of the German press. It is stated, for instance, that an ordinary liver patty is made into fine "Strassburger" pate de foie gras (a goose-liver patty) by means of borax or salicylic acid, and of finely chopped and cleverly distributed pieces of black silk, representing truffles.

Cosmos, a German paper, guarantees the fact that under the label of canned lobsters the soft parts of the cuttlefish and crabs are sold.

In Paris snails are of late very popular, and the adulterators mix them with lungs of cattle and horses. Even entirely artificial snails are manufactured. The shells, recoated with fat and slime, are filled with lung and then sold as "Burgundy" snails.

Lovers of fresh rooster combs are imposed upon by a substitute cut out of hogs' intestines.

Chopped artificial truffles are made of black rubber, silk, or softened leather, and even whole truffles are made out of roasted potatoes, which are given a peculiar flavor by adding ether. They are said to sell well.

Fish spoiled in spite of ice and borax is treated with salts of zinc, aluminum, and other metals. Rubbing the fish with vaseline to give it a fresh look and coloring the gills with fresh blood or eosin—a coal-tar color—is resorted to. The latter is also used to intensify the red color of inferior crabs.

Imparting a greenish color to oysters is another adulteration. An oyster requires about one month in the beds to acquire the greenish color. As this is too long a time, the dealers help them along with an artificial color.

The chemists in the Paris municipal laboratories have shown that tomato jelly is adulterated with turnips, and powdered pepper contains a large admixture of powdered hard-tack.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription, one dollar a year.

## VEHICLES IN INDIA.

THE accompanying illustration shows a vehicle in use in one of the corners of the world that has as yet been untouched by the American invasion. However far the spirit of American enterprise has penetrated, there are many regions where the implements employed for transportation or for daily toil are prehistoric in character. Throughout the main part of British India, for example, the agricultural tools used are the same as those in vogue in the days of Ruth and Boaz, and the vehicles, as may be seen, are of a nature essentially primitive.

Any one who has roamed with Kim over India, and followed the fortunes of Kipling's boy hero across the plains and up the hills, will be interested in seeing the kind of vehicle in which the voluble old lady of pilgrimage traveled. It is illustrated in the photograph shown herewith. This



clumsy wagon, which is known as a reckla, would hardly be regarded in civilized countries as a pleasure conveyance, but it is far superior in construction to the farm carts of the country. The vehicle in common use is a two wheeled cart, of native make, simple and heavy. The tongue is mortised into the axle, and upon this "T" the rack or box is permanently fastened. The end of the tongue is bound stiffly onto the ox yoke. The latter is a simple round piece of timber, three or four inches thick, and about four feet long. It lays on the neck of the bullock, wooden or iron pins being run through its ends, to keep it from slipping off the neck of the animal. The load on the cart is balanced, so that the yoke is held down, and a rope around the neck of the ox takes the place of an ox-bow, and keeps the cart from tipping backward. The cart is dumped by simply unfastening the rope from the neck of the oxen.

The oxen being of the sacred, high-hump variety (familiar to the American public from circus menageries) they are peculiarly fitted for this barbarous yoke, that conveys every motion and jolt of the cart to the neck of the beast of burden.

The tenacity with which these people cling to the tools and methods of their forefathers is illustrated in the experience of an American contractor who was engaged in railway work in



British India. Thousands of natives were employed in carting away the earth thrown out from huge excavations, to another part of the works, and all of the dirt was carried in baskets on the heads of the laborers. The up-to-date and energetic manager, deploring this waste of effort, imported a large number of wheelbarrows. The natives received them cheerfully, and commented admiringly upon their size and strength, although they could not see that the wheels served any useful purpose. They filled the barrows with earth, lifted them on to their heads, and proceeded with their work as before. The American gave up as hopeless the task of modernizing the East Indians.

#### A Hot-Saw.

The International Tube Company of Pittsburg, Pa., controls a patent recently issued to Mr. Peter C. Patterson, of McKeesport, Pa., covering a Hot-Saw. This saw is primarily intended for severing tubes in a hot state as they come from the sizing rolls, and will be located at some point between the sizing and finishing or cross rolls. A trough leads from the sizing rolls and another trough leads to the finishing rolls. In this trough is a section, which constitutes a direct support for a tube while being severed. The saw is of the ordinary rotary type, being secured to an arbor mounted in the outer end of a swinging frame, which is carried by trunnions located at one side of the tube support. Suitable mechanism is provided for swinging this frame, in order to carry the saw across the path of the tube to sever the same. For this purpose, the swinging frame is provided with a rearwardly projecting arm, which is connected to the upper end of the piston rod of a hydraulic or other power cylinder. This cylinder is of the single-acting type and acts to swing the saw across the tube to be cut. A suitable counter-weight is suspended from the rear end of the arm and serves to return the saw to its original position. The counter-weight may be dispensed with if the cylinder is made of the double-acting type. The saw-arbor is provided with a belt pulley which receives a belt acting from any suitable source of power, such, for instance as the pulley on the armature shaft of an electric motor, though other driving means may be employed. When the saw comes into contact with the tube or article to be severed, it of course meets with much resistance, which has a tendency to cause the driving belt to slip, and in metal saws as ordinarily constructed, one of the difficulties is to obtain sufficient power to prevent the slowing down of the saw while in operation. Usually this difficulty is overcome by providing a driving-belt, much wider and heavier than is required by the mere work of cutting the article; but in the present invention this difficulty is overcome by locating the power-driven pulley with reference to the saw pulley, so that as the saw is swung down to its active position, the belt is tightened, thus preventing slipping. To this end, the driving-pulley is located at a suitable distance beyond the pivot points of the swinging arm so that, while the saw swings in the arc of a small circle, the belt in effect becomes the radius of a very much greater circle.

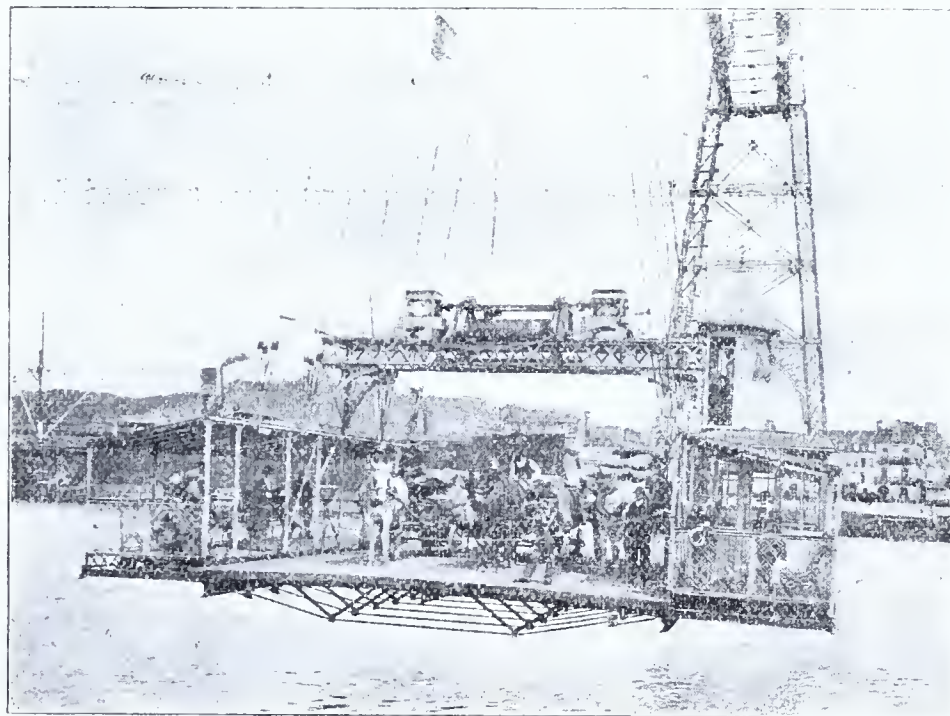
### OVERHEAD FERRY AT NANTES, FRANCE.

THE opening to traffic of an overhead ferry at Nantes draws attention to this method of crossing rivers and channels. There are only two or three of these bridges with suspended carriers in the world; the one at Rouen was described and illustrated in a former number of the INVENTIVE AGE; others exist at Martrou, France, Bilbao, Spain, and Bizerte, Tunis.

The crossing of rivers without interfering with navigation has always been a difficult problem for the engineer, and has been variously solved by the use of suspension bridges, swing, draw and bascule bridges, tunnels beneath the bed of the river, etc.

Suspension or cantilever bridges, in order not to seriously impede traffic, must be built of such a height that the tallest masted ship may sail underneath, and sometimes these masts reach a height of 200 feet. This involves the construction of inclined

Electric power being used to operate the mechanism, and the movable spans being perfectly counterbalanced, less than 20 seconds are required for the complete operation, and the task is accomplished by one man. The Rush street bridge, said to be the most active movable bridge in the world, is frequently opened forty times every twenty-four hours, and traffic is not congested by delays. Swing bridges, pivot bridges, and traversing or telescope bridges are likewise employed. The famous Tower Bridge of London, opened within the last few years, is a combination of a suspension and bascule bridge. It has three spans, and two massive towers support the suspension portion form the middle span of 200 feet. When the draw bridge is open to permit the passage of vessels, traffic is lifted by means of elevators to the suspension bridge, 140 feet above. This has the disadvantage, however, of wasting time in



approaches, and means that all the traffic that passes over the bridge must be lifted to a corresponding height. Supposing the gradient to be 1 in 20—a reasonable one—the traffic will have to go over an incline of more than 1,000 yards in length before reaching the bridge, and descend on the other side in order to reach the ground again. This makes the cost of the bridge—except in rare cases where the banks of the river are high—too expensive for ordinary application. The Brooklyn Bridge, for instance, with a height of only 135 feet, involved a cost of over \$15,000,000.

Swing, or bascule constructions have been known in some form or another ever since the days of moats and draw-bridges. These have attained their greatest development, in recent days, in Chicago. A number of rolling lift bridges, as they are called there, are employed in the busiest parts of the busy city's waterways. On the approach of a boat, the bridge opens across the middle, and each half rears upright on the bank on which its shore end rests.

ascending and descending; and the rolling lift bridges, at best are adapted for use over relatively narrow channels. They cannot be employed over channels near the open sea, or in places where vessels cannot be under complete control, regardless of the weather. In fact, swing, draw and bascule bridges are adapted only for inland rivers or canals.

The advantages of the overhead ferry are that the channel to be crossed is left entirely clear at all hours, without requiring vessels to make any special signals, or modify their rate of speed. There is also no increase of the distance, or ascent or descent, imposed upon traffic in order to cross from one shore to another. Being constructed on an air line, it realizes the minimum distance to be crossed.

The new bridge at Nantes is a stately structure, consisting of two tall steel towers, one on each bank of the river, joined by a horizontal bridge or railway truck 490 feet long and 165 feet above the surface of the water. An inverted steel carriage or car

travels along the rails, and suspended from this by steel cables is the platform or ferry, which has two divisions, one for horses, vehicles and railway cars, and the other for foot passengers. Electric motive power operates the car from which the ferry is suspended, and the crossing is thus quickly and easily effected. Foot passengers who use the ferry will pay one cent for crossing; vehicles from five to ten cents.

The frame can roll over the rails in both directions at pleasure. In order to prevent any swinging motion which might result from the pressure of the wind, the rods by which the carrier is suspended are arranged in triangles, both in the longitudinal and transversal directions. There is thus, in effect, a railway for crossing the river, the only difference from ordinary constructions being that the body of the vehicle, instead of being above the rails and wheels, is 160 feet below them. It possesses, it is said, the same speed and regularity of motion that can be obtained on any straight and horizontal railway line. The last advantage claimed for the overhead ferry is that it is economical of construction, the one at Nantes having been erected at a cost of only about \$200,000.

The photograph shows the carrier, with one of the towers and a portion of the overhead bridge in the background.

#### Cotton Culture in the German Colonies.

In order to meet the constantly growing demand for cotton in the German textile industries, the attempt has been made to grow cotton in the German African colonies, and according to the trials already made, the success of this new undertaking seems almost assured. Cotton plantations have been established in Togo, Kamerun, German Southwest Africa, and German East Africa. A German syndicate also contemplates the culture of cotton in Asia Minor. In Togo the development of the cotton culture has been most successful, so much so that the second year's crop—that of 1902—was as large again as that of the first year, 50,000 pounds of cotton, having been exported. The cost of producing 500 pounds of cotton, exclusive of business management and amortization, was \$48.87, while the selling price realized was \$78.75.

Great efforts are being made to further the cotton culture in the German colonies, and the most important cotton mills of Germany have, after thorough trial, declared Togo cotton to be of excellent quality, and are indorsing the efforts of the German colonial cotton growers, hoping thereby to become independent of American cotton, especially as Germany manufactures at present about \$200,000,000 worth of cotton goods yearly, giving employment in its cotton industries of all kinds to over 1,000,000 workmen. It is claimed that America is unable to cover the world's demand for cotton, thereby causing cotton to become not a staple article of commerce, but one of speculation, and therefore greatly detrimental to the cotton-textile industry.



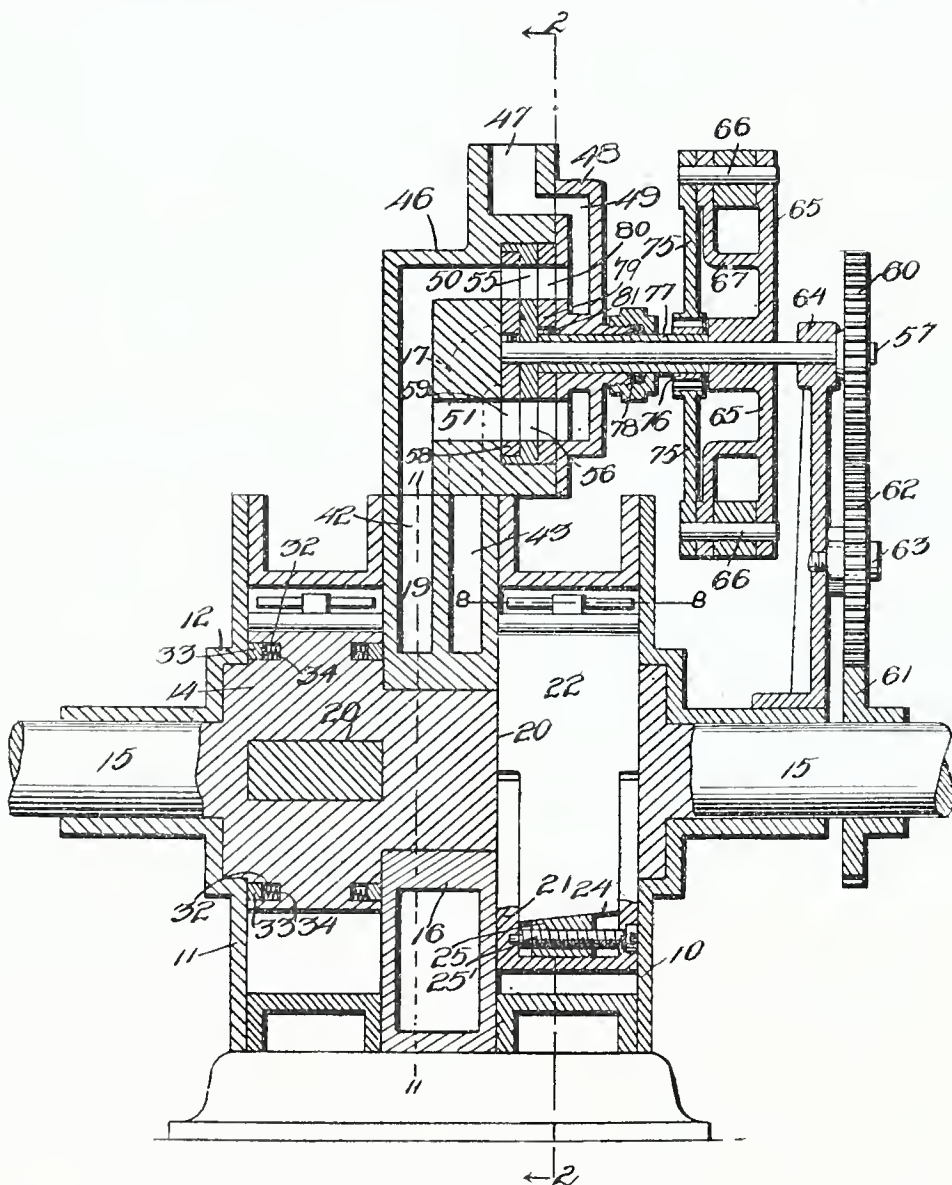
## CLEVER NEW PATENTS.

Rotary Engine.—Seal-Lock.—Bed-Bottom.

## Rotary Engine.

A rotary engine having a number of novel features has been patented by Mr. John Putman, of Lovington, Illinois. The cylinders are arranged side by side, and provided at one end with a removable head 12, having a recess for the reception of the reduced end portion of the circular piston-body 14. Two piston-bodies are used, one in each of the cylinders, and both are secured to a shaft 15, having a reduced central portion or hub 16, slightly separating the piston-bodies from each other. Around this central portion or hub is fitted a two-part casting 19, forming a head for the adjacent ends of the two cylinders, and being provided with suitable ports or passages for admitting steam to the cylinders and permitting its escape therefrom after passing through the cylinder.

The two piston bodies are provided with slots 20, arranged approximately at right angles to each other and adapted for the reception of sliding abutments. One abutment is arranged at each cylinder, and each of the said abutments is in the form of a substantially rectangular plate formed in two sections 21 and 22. The section 21 is provided with a recess in one of its faces for the reception of the reduced end 23 of the section 22, and in the end of said section 23 is formed an inclined slot 24, in which is fitted a sliding wedge-block 25, having a flat face engaging with one wall of the recess in the section 21 of the abutment, while the inclined face engages with the inclined end wall of the slot 24. The sections are so made as to slightly overlap in order to prevent the passage of steam, and the construction is such that the juncture of the two sections of



each abutment is always disposed within the slot in the piston-body. In the wedge-block 25 is a threaded opening adapted for the reception of the threaded portion of a screw 25.

In the two-part central section 19 are two steam-ports 42 and 43, leading, respectively, to the cylinders 10 and 11, and in said central portion are two exhaust-ports, both leading to a common exhaust.

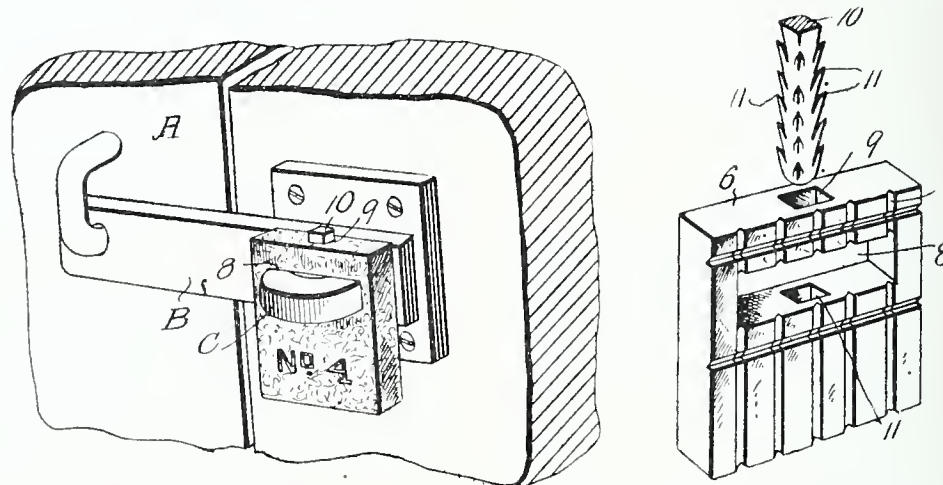
Secured to the central section 19 is a steam-chest 46, into which steam is admitted through a port 47, the passage of the steam from this port to the ports 44 and 43 being governed by a peculiar form of valve mechanism. The steam chest is provided with a removable head 48, having a chamber 49, from which extend four ports or passages arranged at angles of ninety degrees from each other, the upper and lower ports in the same vertical plane leading through the port 42 to the cylinder 10, while the remaining ports 51 of the horizontally-aligned pair lead through the port 43 to the cylinder 11.

Secured within the steam-chest is a flanged disk 55, having four openings 56, arranged in line with the ports 50 and 51, said disk being rigidly secured in place and provided with a central opening for the passage of a revoluble shaft 57, on which is mounted a disk valve. The valve is provided with two ports of segmental form, each extending through an arc of about 90 degrees, and the ports being arranged at diametrically opposite points, so that as the valve revolves, the pairs of horizontally aligning and vertical aligning ports of the disk 55 will be alternately placed in communication with the steam-chest, steam passing simultaneously through both ports of the pair to supply steam to the same cylinder. The outer end of the shaft 57 is provided with a gear-wheel 60, driven by a gear-wheel 61 on the main shaft 15 of the engine through an intermediate gear 62, mounted on a stud 63, carried by a standard 64, which also serves as a support for the shaft 57.

## Seal-Lock.

A resident of Lawrence, Kansas, Mr. George B. Edgar, has invented and patented a seal-lock. He has obtained patents in this line before, but his latest improvement is clearly an advance step in the art. The invention is to provide a frangible seal by means of which any attempt to effect an entrance to the car, box or crate, will be indicated, and which, when unsealed, or broken cannot be restored to its normal condition, or partially restored, so as to avoid detection.

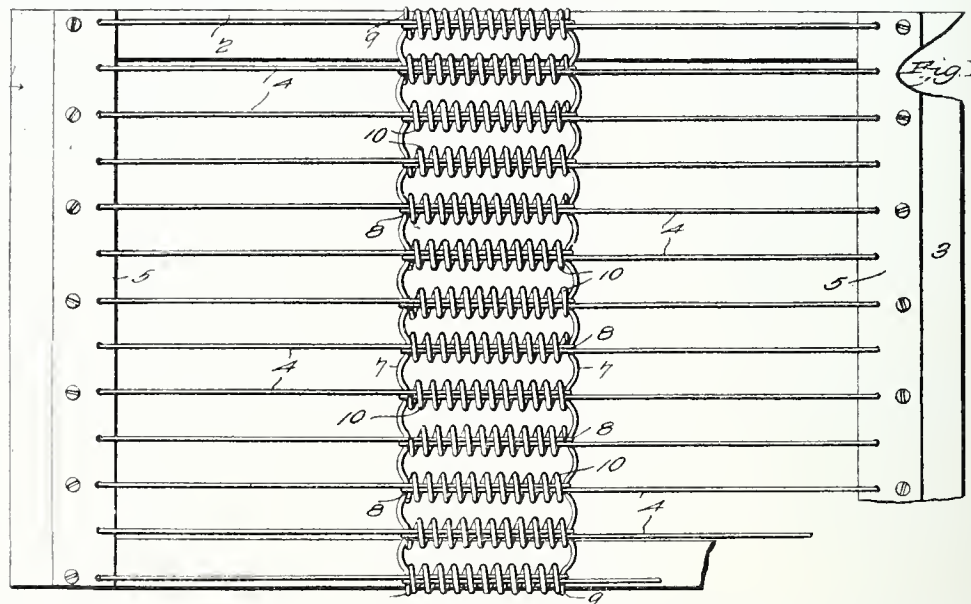
The invention consists in a seal formed of frangible material provided with a longitudinally-disposed slot or opening for the reception of the staple, the seal being held in contact with and locked against the hasp by means of a bearded pin, which enters an aperture formed in the top of the seal and passes through the staple, the end of the pin being firmly embedded in the body of the seal, thereby preventing the pin being withdrawn and the car-door



opened without shattering the seal. The manner of attachment and operation of the lock is as follows: The car-door being closed, the slotted end of the hasp is passed over the staple, and the seal placed in position by sliding the block over the staple with its weakened or roughened face in contact with the hasp. The locking is now accomplished by driving the pin with a hammer or other tool through the opening in the top of the seal, the pin passing through the staple and into the seat or opening, the resilient spurs or teeth embedding themselves in the interior walls of said opening by giving the pin a slight upward movement after it has been driven to its seat, thereby preventing the pin being withdrawn or the car-door opened without breaking or otherwise destroying the seal.

## Bed-Bottom.

A wire bed-bottom guaranteed not to sag at the center and obviating the objections to many woven wire mattresses, has been patented by Mr. Albert E. Beall, of Clinton, Iowa, who has assigned his entire interest to Cora E. Beall of the same place. The bed-bottom comprises a plurality of supporting strands 4, each composed of two pieces of wire, one terminal of each of which is connected with a metallic batten 5, secured to each of the end cleats. To hold the two strand sections in operative position for use, two cross-strands 7 are employed, which constitute pressure-eveners. To associate the eveners with the supporting strands, the terminals of the latter are bent into loops or eyes 8, and through these the eveners are passed and lie under the supporting-strands, the terminals of each of the eveners being held from disconnection with the eyes of the terminals of the two outside supporting-strands by providing the terminals of the eveners with eyes or loops 9, which constitute stops. The pressure eveners are constructed of corrugated wire, and are thereby adapted to yield to transverse pressure.



The terminals of the supporting-strands overlap each other, and inclosing the overlapped portions and bearing at their ends against the eveners is a series of coiled springs 10, one for each of the supporting-strands, these springs exerting resistance to yielding by having their whorls compressed instead of being extended, as usual. This function is obtained by disposing the springs between the eveners, which latter are drawn toward each other by the opposite movement of the members of the supporting-strands when pressure is applied to the bed-bottom, thereby contacting with the ends of the springs and compressing them. By securing the desired yielding movement of the bed-bottom by compression of the springs 10, all danger of breaking the latter will be entirely obviated, and, further, the desired yield of the springs will be secured with less longitudinal movement of the supporting-strands than if the said springs were stretched or extended, as with beds of this character generally in use.



## COMMERCIAL POSSIBILITIES OF RADIUM.

An article published in the INVENTIVE AGE for August gave some account of the discovery of radium and of the interest awakened in the scientific world. It is almost impossible to keep up with the new developments in this line, as experiments are constantly being made, and hardly a newspaper appears without an article describing some new step in its use or application. All sorts of medical uses are attributed to it. A series of experiments on a blind child in New York seem to have proved beneficial, if not the entire success that was at first advertised. In cancer, too, it has been found useful.

It is known that radium possesses all the value of X rays, plus the inestimable advantage of beautiful consistency and delicate response to regulation. Already, it has been found that a small tube, no bigger than a goose quill, containing one-fifth to one-tenth of a grain of radium, is as effectual as a costly and elaborate electrical apparatus, accomplishing results in the cure of cancer which exceed the best achievements of the X-ray. The ease with which it can be applied locally (as for example, to the nostril and the throat) is of immense surgical advantage.

Another experiment which will be watched with much interest is the application of radium in the treatment of consumption. It is argued that, as it has been found to cure consumption of the skin (lupus) it should also cure consumption of the lungs, if its rays can be brought to bear directly on the diseased lung tissue, without any intervening substance, such as the chest wall. At first sight, this seems rather a difficult thing to do, as it is, of course, out of the question to place any solid mass of radium within the lungs themselves. But recent research has indicated that radium in solution gives off a gas that possesses some of the qualities of radium itself; that is, the gas is also radio-active. So all that is necessary to subject the internal lung tissue to the direct action of radium rays, is to breathe a mixture of air and the radium gas. By this means, it is hoped that a new and valuable remedy for consumption will be available to the pathologist. It must be remembered, however, that even if radium proves valuable in the treatment of pulmonary tuberculosis, its cost is so high—several hundred dollars a grain—that it could not come into general use at present.

The full therapeutic value of radium, of course, has not yet been ascertained; but although the results of medical experiments are to an extent capricious, and more than once its use has proved harmful instead of beneficial, it may be assumed that with the wider knowledge of the substance that the future promises us, better consequences will follow. In other lines besides the medical, radium is found to be valuable. In spite of the exorbitant price demanded for it, it has commercial possibilities. Radio-activity has a much more direct and

vital bearing on commerce and industry than is generally imagined. The demand for the substance for the use of science alone is making a new industry in Germany and France, where it is being supplied at the rate of \$60,000 per ounce. Of course, this price is altogether arbitrary, but when the possibilities of this extraordinary product are examined, it will not be surprising if before long the demand expresses itself in pounds instead of grams and ounces. Search is constantly being made for the most fruitful environment of radium. When it can be produced in slightly larger quantities, the present nominal price will come down with a rush, and experiments will increase a thousand fold. There is now something of a commercial demand for uranium, and as the radio-activity of radium is one million times greater than that of uranium, some idea of the ultimate commercial value of the former product may be obtained.

Whatever may be the application of radium to therapeutic purposes, it is probable that commercially it will be found in the future to be more valuable as an illuminant. It must be remembered that radium is not luminous, nor does it give out light rays. Its use, therefore, for purposes of illumination depends upon its happy combination with some substance possessing the property of fluorescence. A very little radium will so powerfully excite fluorescence in sulphide of zinc as to supply effective and practically permanent illumination. All the artificial illuminants now employed are the outcome of immense waste of energy, producing more heat than light. It is believed that radium will be the main factor in a future form of illumination which will effect economies in coal of incalculable importance. In this connection may be noted a cryptic remark of Sir Oliver Lodge that if the secret of the fire-fly were known, a boy turning a crank could furnish sufficient energy to light an entire electric circuit.

It is perhaps too speculative to consider the possible future application of radium to the supply of other forms of energy. As a source of power it cannot be compared with carbon, for the simple reason that its supply will probably never be sufficient. If radium could be produced synthetically from the fental element, which appears to be hydrogen, a new commercial era would be inaugurated and a new literature of dynamics. Be that as it may, it is not without immediate interest to bear in mind some observations by a scientific writer in the *London Times*.

The most striking fact of radio-activity is its unalterability. Radium contains an immense reservoir of energy, sufficient to maintain its continuous powerful radiations over many centuries; but all attempts to increase its activity and make it supply its energy at a faster rate have signally failed. Suppose that it is ever found possible to accomplish

this, and to concentrate the output of energy, which is now being dissipated over several centuries, into the space of time represented by a few days or weeks—then there is not the least doubt of the result which would follow. Rutherford has calculated from his own experiments and those of Curie that the energy stored up in one gramme of radium is sufficient to raise 500 tons a mile high. An ounce would therefore suffice to drive a 50-horse power motor-car at the rate of 30 miles an hour around the world. This possibility of our being able in the future to control the store of energy in radium and to liberate it for use as required at any desired rate is, of course, the most interesting feature of radio-activity at the present time. But it must be confessed that science holds out scant prospect of its fulfilment. No suspicion of its ultimate accomplishment has as yet loomed above the horizon of practical possibilities. If it ever became possible for radium, it would almost certainly be possible for uranium and thorium, elements which can be produced by the ton, and which probably contain no less a store of energy than radium, but are evolving it at a vastly slower rate. Our fathers busied themselves with speculating what would become of us when the world's supply of coal was exhausted. A single step in science is needed for that problem to be answered in a manner beyond the dreams even of the scientific novelist. It is evident that even in these early days, radio-activity has proved to possess intrinsic commercial value in a high degree.

Apart from considerations of its value for purposes of trade, the question of its real nature is the one that most absorbs scientists, and has appeared to upset many accepted theories as to the properties of matter. The phenomenon presented by radium, as well as by the kindred substances, uranium and thorium, is their apparent ability to give off actinic rays of peculiar chemical properties, somewhat similar to the X-rays, without any perceptible loss of energy or bulk. Based on these observed phenomena, several new theories of

matter have been put forward, all of which accepted as a fact the apparent origin of the energy within the substances themselves. It remained for an American investigator to supplement the wonderful discovery of Monsieur and Madam Curie by a theory that seems more plausible than any yet advanced. Mr. Thomas A. Edison believes that the energy emitted by radium is merely reflected from some unknown source. He says:

"I have made extensive experiments with the Roentgen ray and with radium, and have come to the conclusion that these new substances are not the sources of energy, but are rendered fluorescent by the action of some hitherto undetected vibration or ray. Just as the Roentgen ray and the Hertzian wave remained undreamed of for centuries after the phenomena of sound, light and heat were well understood, so it is not only possible but extremely probable that there are other rays that we have not yet discovered. In my own experiments, I have found that the ordinary electric arc, when raised to an extremely high temperature, gives off a ray which renders oxalate of lithium highly fluorescent. In the same way, the X-ray causes in platinum, baryum-cyanide, as well as other substances, a condition of activity which results in the emission from them of actinic rays and a small amount of heat.

My theory of radio-activity is that the rays which the new elements emit are set up in the same way, the substances being rendered fluorescent by some form of ether vibration which is undoubtedly all-pervading but has not yet been isolated or measured, and which may have some extra planetary origin. To accept any other theory is to declare one's belief in perpetual motion, in getting something for nothing."

To keep themselves posted in the progress of the art in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

## PATENTS

Send Your Business Direct to Washington .:. .:  
:. .: Saves Time and Insures Better Service.

Caveats,  
Trade Marks,  
Copyrights  
and  
Designs.

My office is close to U. S. Patent Office. FREE report as to patentability made. Personal attention given—TWENTY-THREE YEARS PRACTICE. Book "How to Obtain Patents," etc., sent free. Patents procured through E. G. Siggers receive special notice, without charge, in the—

**INVENTIVE AGE**

Illustrated Monthly—Fifteenth Year.  
Terms, \$1.00 a Year.

**E. G. SIGGERS,** 918 F STREET, N. W.,  
WASHINGTON, D. C.



## MECHANICAL INVENTIONS AND DESIGNS

Patents for which have been procured  
through the Patent Soliciting Office  
of E. G. Siggers, Patent Lawyer,  
Washington, D. C.

Charles Highers, inventor; Charles Wiggins, assignee, Vicksburg, Ky. Whiffletree.—This invention is adapted to increase the strength of singletrees and doubletrees and prevent accidental displacement of the traces, and at the same time permit the ready removal of the latter. The whiffletree consists essentially of a wooden bar or body provided with a longitudinal groove, and a rod arranged in the groove and secured to the bar or body by bends or rings. The ends of the rod are bent into substantially U-shaped trace-hooks, which extend across and fit against the ends of the bar or body, whereby the traces are effectually prevented from becoming accidentally unfastened.

John W. Tillman, inventor, Cooper, Texas; O. M. Fly, assignee, Gibson, Tenn. Clothes Pin.—The object of this invention is to provide a clothes pin, of simple, inexpensive, strong and durable construction, adapted to remain permanently on a clothes line. The clothes pin, which is capable of adjustment to any portion of the line, is constructed of a single piece of wire, and consists of a central line-receiving loop, and arms extending in opposite direction from the loops and provided with transversely disposed spring jaws, arranged to straddle the clothes line and adapted to clamp clothes or other fabrics to the same.

Levi D. Gibson, inventor, Thurber, Texas; Robert Loffin, Thurber, Texas, and Herman F. Scheer, Dallas, Texas, assignees. Mechanical Movement.—The mechanical movement, which is designed to produce alternating rotary movements, is adapted to be employed for a variety of purposes, but will be found especially advantageous for imparting movement to the dashers of churns and the agitators or rubbers of washing machines. A vertically disposed rotary spiral is engaged by a laterally projecting arm of a connecting rod which extends upward to a crank shaft. The crank shaft, which is located at the upper end of the spiral, has a crank bend to receive the connecting rod and is adapted to be rotated for imparting alternating rotary movements to the spiral. The spiral is connected at its lower end with the device to be operated.

Charles E. Mickley, inventor, York, Pa.; Walter F. Myers, same place, assignee. Automatic Railway Crossing Gate.—It is the object of the present invention to provide an improved train-operated apparatus for controlling the swinging gate members at a railway crossing, for closing the gates before a train reaches the crossing, and to open the gates after the train has passed. Vertically swinging trip devices are mounted on the under side of the cross ties and project upwardly therefrom into the path of the flanges of the wheels. These trip devices are connected with the swinging gate members. When a train approaches in either direction, the wheel flanges operate the trip projections and swing the gate members downwardly to a horizontal position. The gate members will be held down until the rear end of the train has passed the crossing, when they will be permitted to return by gravity to an upright position.

Martin Farrell and Charles Heath, and Walter I. Tay, Binghamton, N. Y. Cigar Box.—The patent obtained on this invention has been as-

signed to the Farrell-Tay Paper Box Company of Binghamton. The object of the inventors is to provide a cigar box which is formed of paper and has all the appearances and requisites of a wooden box. The bottom and side walls are cut from a single blank, while the ends and front are reinforced by supplemental strips glued thereto. The exterior is covered with paper printed in imitation of wood and the box may be lined with cedar veneer, if desired, to give the desired flavor. The general appearance of the receptacle, when complete, is that of any ordinary cigar box, and while just as satisfactory for its purpose can be manufactured at much less cost than the wood receptacles.

Charles W. Umholtz, Bristol, Va. Coke Oven Larry.—An unusually broad patent has recently been issued to Mr. Umholtz for a larry having certain novel characteristics designed to facilitate the unloading of the slack at the coke oven and to prevent waste during the transit of the larry to the coke oven from the mine tippie. It is explained in the patent that ordinarily the outer sections of the larry chutes are raised during the movement of the larry from the loading to the unloading station, and that it is practically impossible to prevent waste of the slack along the road; this waste being, of course, doubled when the larry is of double form. It is also pointed out that it is ordinarily necessary to scrape the slack out of the chutes in consequence of the insufficient pitch of the latter, a greater pitch being impossible for the reason that the slack would run over the sides of the chute and be lost.

In the patented construction these various objectionable features are eliminated by increasing the pitch of the chutes and by providing doors which, during the transportation of the slack, prevent the latter from flowing out into the fixed chute sections. These doors, however, are operatively connected with the movable chute sections, so that when the latter are swung down at the oven, the doors will be automatically opened to permit the slack to flow through the chutes to the ovens from the larry.

Clarence W. Parks, Lowell, Mich., inventor; Alonzo O. Freeman, Ionia City, Mich., assignee one-half interest. Two patents.—The first patent issued to Mr. Parks discloses an efficient insecticide sprayer embodying an extremely simple and ingenious construction. The reservoir or receptacle is carried by means of a handle or grip, which constitutes a part of the discharge pipe. The pipe is extended beyond the handle to form a spray nozzle and is provided with a controlling valve, the lever of which is located over the front end of the handle for actuation by the thumb of the person carrying the device. The device is thus carried and the discharge of liquid is controlled by one hand. At one end of the receptacle is located a pump, by means of which a sufficient amount of air may be compressed within the reservoir above the liquid to compel the expulsion of the latter in a fine spray when the controlling valve is opened.

The other invention relates to a cream separator which has become quite well known as the "Michigan." The separator is carefully constructed, is extremely easy to handle, and is perfectly sanitary. The process of raising the cream is scientifically correct, and it is claimed that in from one to three hours, twenty to thirty per cent more butter can be produced than in the old way. The receptacle or can is tiltably mounted in a light but substantial frame, and is capable of being easily manipulated to facilitate cleaning, etc. The cover is removable and is provided with a strainer and the

aerator carries the air down to the bottom, discharging the air at the lowest point, permitting it to rise through the entire body of milk, cooling the same, and eliminating all impurities and odors, making it clean, perfectly pure and sweet. The frame is so constructed that while it ordinarily constitutes a stand for the can, the latter may be displaced from its mounting and enclosed within the frame, which latter will then constitute a shipping crate.

Charles S. Exley, Derby, Iowa. Telephone Exchange.—A novel telephone exchange, particularly useful in small systems, has been patented by this inventor. Broadly stated, each line is provided with an independent signal connected with its line by a switch. A plurality of independent exchange contact devices are employed, each having a number of spring jacks that are adapted to be connected with the different lines by the switch employed for connecting the lines with the signals. The usual exchange instrument is adapted to be connected with any of these exchange contact devices by means of a switch comprising a flexible cord and plug. Under normal conditions, the line wires are connected with their respective signals, so that, should a subscriber call up central, his signal will indicate the call at the exchange, thereupon the operator connects his instrument with one of the exchange contact devices, and, at the same time disconnects the linewire from the signal and connects it with the same contact device. This throws the subscriber and operator of the switch in communication, and upon ascertaining the number the caller desires, the plug from that number is removed from its signal contact and attached to the exchange contact device. This places the two parties in communication, and at the same time the operator can ascertain when the subscribers have finished.

Clinton D. Cannon, inventor, Battle Creek, Mich.; Corodon S. Cannon, assignee, Dowagiac, Mich. Method of Casting and Articles Made Thereby.—While the invention relates more particularly to the manufacture of vehicle wheels having cast metal hubs, it is not limited to such use. The object is to obviate the necessity of carefully made sand molds by employing a form of shell which becomes incorporated with, and constitutes part of, the finished article. To this end such shell is constructed of sheet metal and preferably is composed of adjustable sections. Through the shell are passed the spokes of the wheel, and the whole is then surrounded with packed sand. Molten metal is afterwards introduced into the shell and the article is practically complete; for when the sand has been removed, it will be found that the shell presents a finish upon the exterior of the casting and has become incorporated with the metal within the same so as to make a homogeneous structure.

Leander C. Smith, Nashua, Iowa. Boot or Shoe Cleaner.—A base plate is provided, having at its opposite edges downwardly inclined sets of spurs that incline in the same direction. Upon the central portion of this plate is mounted a transverse boxing, constituting a receiver for slidable telescoped supporting sections, that are urged towards each other by a spring connecting the same. The sections carry at their outer ends upstanding holders for brushes that are thus yieldingly urged towards each other. At one side of the boxing is formed a pocket constituting a receiver for an upstanding brush, while on the other side is located a brace or guide connecting the upper edge of the boxing and the base. In use, the shoe or boot to be cleaned is drawn

across the boxing, and thus the dirt is scraped from the bottom of the shoe by the advance edge. The foot afterwards passes over the upstanding brush and between the side brushes, which thoroughly removes all dust and dirt.

Ray W. Hodgins, Grand Rapids, Michigan. Level.—In this device a body block of the usual form is employed and is provided with a central circular opening having inset seats in its upper and lower walls. This opening is covered with suitable transparent material held in place by metallic rings, that are provided with indicator scales. A frame comprising side members, held apart at their ends by blocks, extends across the opening and has its ends located in the seats, being adjustably held therein by a suitably set screw. A weighted pointer is pivoted to and between the side members, and has a free revoluble movement within the circular opening; this pointer coacting with the scales of the holding rings.

Charles E. Burkholder, Marion, Pa. Pump Operating Device.—The principal feature of the invention resides in the connection between the handle or operating lever and the reciprocating element of a pump. The standard that comprises the support for the handle has an intermediate vertical slot, and is furthermore provided at its upper end with an offset bracket carrying anti-friction rollers between which the reciprocating element operates. The operating lever is pivoted in the slot, and is reversible so that it can be used either side up. One arm of the lever constitutes the handle, while the other arm is in the form of a curved segment having a similarly formed slot. This segment passes through an opening formed in the reciprocating element, and a roller journaled to the element operates in the slot. Thus as the handle is moved up and down, not only is a greater leverage exerted, but the friction is reduced to a minimum.

Jessee Schaeffer, Berlinsville, Pa. File.—A secure holder for papers and documents is covered by this patent. A base is provided carrying an intermediate upstanding and offset stem that supports a horizontally disposed circular base ring. Coacting with the ring and located above it is a clamping bar that extends across the same, and is carried by the offset neck of a shank that is slidably mounted on the standard. The shank has a coiled spring surrounding it and urging it downwardly so as to normally hold the bar upon the ring. The lower end of the shank extends forwardly so as to constitute a handle by means of which it may be operated. The papers are supported upon the ring and beneath the bar which clamps the same, but at the same time permits the removal of any paper desired without disturbing the others.

Clayton M. Schooley, Leesburg, Va. Pliers.—The pliers forming the subject matter of this invention are particularly intended for use in stretching and holding wire. Crossed pivoted members or levers are employed, certain of the ends constituting handles, the opposite ends being formed into jaws. The jaws are provided with cutters by means of which wire may be served. Projecting from the side faces of the levers, but on the opposite side of the pivot to the jaws, are clamping lips that may be termed supplemental jaws. A spring is employed for normally holding the jaws closed. This spring comprises a fastening block secured to the inner side of one handle, and having a blade that extends contiguous to the other handle, where it passes through an eye formed upon the same. Links are fastened to the free ends of the handles, and are designed to receive a snap hook by means of which the wires may be supported.





Advertisements inserted in this column for 20 cents a line (about 7 words) each insertion. Every new subscriber sending \$1.00 to THE INVENTIVE AGE will be entitled to the AGE one year and to five lines three times FREE. Additional lines or insertions at regular rates.

**FOR SALE**—Patent No. 738,615. Dated September 8, 1903. Saw-set. Works like a charm. Simple and durable. Address, Paul H. L. Kleite, Sesame California. feb

**FOR SALE**—Patent No. 737,597. Cross Line Buckle. A perfect takedown buckle. The best and safest thing out. Address, H. S. Englebright, North Yamhill, Oregon. feb

**FOR SALE**—Patent No. 742,660, dated Nov. 10, 1903. Mail box for use in rural free delivery. Approved by Postmaster General. Address, Elmer E. Reese, Rolling Prairie, Indiana. feb

**FOR SALE**—Patent No. 734,032. Dated July 21, 1903. Switch Stand. Address, A. B. Bulloch, Edwardsville, Alabama. feb

**FOR SALE** or manufacture on royalty—Patent No. 699,991, dated May 13, 1903. Steel Cooking Stove or Range. The best on the market. Address, B. A. Vaughn, Box 74, Corning, California. feb

**FOR SALE**—Patent No. 736,455, dated August 18, 1903. Adjustable tool for removing any size screw caps from jars or cans, and for cutting tin lids from cans. Will sell outright. Address, Fred L. Stork, No. 34 Webster Street, Dayton, Ohio. jan

**FOR SALE**—Patent No. 741,894, dated Oct. 20, 1903. Improved copy holder, suitable for any make of typewriter. Address, Durham and Peek, Aurora, Ill. jan

**FOR SALE**—Patent No. 739,715, Eureka Dumping Wagon or Car. Dated September 22, 1903. Address, A. H. Randolph, Corry, Pa. jan

**FOR SALE**—Patent No. 737,739, dated September 1, 1903. Improvement on all other non-refillable bottles. Send for drawing free. Impossible for this bottle to be refilled. Terms cash or royalty. Address, C. Holloway, Lincoln, Ill. jan

**FOR SALE**—Patent No. 735,763, Surveying Instrument. Address, G. W. Holland, First National Bank Building, Brainerd, Minn. jan

**FOR SALE**—Stove for laundry and heating rooms, sliding top and two inch pipe, burns charcoal, wood or coke. Can be made at small cost. Simple, but strong. Write, E. C. Leonard, Thompson, Pa. jan

**FOR SALE**—Just issued patent axle for vehicle with changeable points. Old points can be removed and new replaced in a few minutes at small expense. Cash, trade or royalty plan. Address, G. B. McWilliams, Box 395, Olney, Ill. jan

**FOR SALE**—\$600 buys patent on Foldable Camp Stool. Fold 2½x2½x24 ins. Very strong, compact, easy to manufacture. 3,000 already in use. For details write to Paul R. Anton, 209 E. 2nd street, Topeka, Kans. jan

**FOR SALE** or Manufacture on Royalty—A patent Combined Refrigerator Counter for butchers and domestic use. It requires only half the ice that is required to keep other refrigerators cool. Address, Messrs. Shanklin & Hausam, No. 1822 Agnes Ave., Kansas City, Mo. jan

**FOR SALE**—Manufacturers of Novelties, write for particulars. I have a novelty invention that can be manufactured and sold at not less than six hundred percent profit. Address, C. M. McClune, Galeton, Pa. jan

**FOR SALE**—Patent No. 737,851, issued September 1, 1903. Farmer's Butchering Scaffold. A practical, money making invention of universal need. Offers for state rights considered. Investigation solicited. Address, George M. Landers, Box 20, Terra Haute, Ind. jan

**FOR SALE**—Patent No. 735,885, dated August 11, 1903. I offer for sale an Incubator, non-moisture; has been tried and proven; can furnish testimonials and full proof as to merits of same. Will be pleased to correspond with all interested parties. Address C. B. Kenyon, R. F. D. No. 3, Greenwich, N. Y. jan

**FOR SALE**—Patent No. 722,092, March 3, 1903. Stop Cock for hot or cold water drawn with one handle. \$10,000, or shares stock company. Address, P. R. Fern, Larrobe, Pa. dec

**FOR SALE**—United States patent No. 724,819. Rotary Motor. Combines the wedge, screw and lever advantages in a powerful, economical, and durable compound motor or engine without a dead centre. Address, James M. Crowley, Carl Junction, Mo. dec

**FOR SALE**—Patent No. 729,925, dated June 2, 1903. Farm Gate. Can be manufactured very cheaply. The hanger may be placed on any wood gate, and give it a rolling movement. Price \$600. For drawings and particulars, address, Daniel J. Fuller, Oxford, Indiana. dec

**FOR SALE** or on royalty—Patent No. 682,257, November 10, 1902. Device for marking the ears of cattle. It cuts the owner's initials in the ears of the animal. For particulars address, Jacob Hinz, Jr., Canistota, S. D. dec

**FOR SALE**—Patent No. 734,003, Tire Setter and Cooler. Best thing out. Fills a long-felt want. Write to J. B. Preston, Rushville, Ill., for particulars. dec

**FOR SALE**—Patent No. 725,682, dated April 21, 1903. Novel pawl for looms or any place where pawl and ratchet are used. Perfected and in use. Money in it for the right man. Send for cut and testimonials. Address, I. W. Doeg, Newmarket, N. H. dec

**FOR SALE**—Patent No. 715,678, Napkin Holder. Prevents soiling the clothes, is easily adjusted to the body, and not expensive. For further particulars write to L. J. Martin, Orange, Va. dec

**FOR SALE** or on royalty—Patent No. 680,755 dated August 20, 1901. Patent No. 733,454, dated July 14, 1903. Corn Cutter and Crusher. Will crush three bushels of corn a minute with two H. P. Can be manufactured for about one-third selling price. Address, J. S. Bloom, Winthrop, Iowa. dec

**FOR SALE**—Patent No. 532,072. One-half interest in patent fannel and measure, patented January 8, 1895. Will sell cheap. Address, Lafayette Palmer, No. 1724 Penn. Street, Harrisburg, Pa. dec

**FOR SALE**—Patent No. 719,170, dated Jan. 27, 1903. Folding Camp Chair. Possesses great advantages over other camp chairs. Address, Eli F. Zimmerman, Mansfield, Ohio. apr

## WANTED.

### NOTICE TO MANUFACTURERS.

I have just had a new Lap-Ring patented; on what terms can I get it manufactured. Answer at once please: Thomas Cotten, Linn, Miss.

YOU SHOULD SUBSCRIBE FOR THE

## ARMY AND NAVY = = = MAGAZINE

It contains in every issue a number of ably written articles from the pen of all standard contributors. It also contains a number of important and valuable illustrations of notable people and prominent things and events.

### A JOURNAL OF QUALITY.

AN UNEXCELLED ADVERTISING MEDIUM.

The Handsomest Military Publication Ever

Issued. The ARMY AND NAVY MAGAZINE, Washington, D. C. Herbert Cecil Lewis, Editor. Subscription, a year. \$3.00

## Thousands

of inventions in the field of Railway and Engineering are being patented every year.

## The Railway and Engineering Review

carries more advertisements of patent attorneys than any other railway paper in North America.

For rates, address—

The Railway and Engineering Review,  
1305 Manhattan Building, Chicago.

Now is the time to subscribe for

## Cement and Slate

It is the only journal in the United States devoted exclusively to the interests of these products.

SUBSCRIPTION \$2.00 PER YEAR.

E. F. OCHS & BRO., Publishers,

Send for sample copies. ALLENTOWN PA.

## SELF-EDUCATION FOR MECHANICS.

A Monthly Journal intended as a Guide to Correct Methods in Work and Study.

25c. A YEAR. SAMPLE COPY FREE

Industrial Publication Co.,

16 Thomas Street, - - NEW YORK.

## E. C. WILEY, Mechanical - - -

Engineer,  
Office 811-1-2 Main Street,

Lynchburg, Va.

Special attention given to correctly designing and preparing working drawings for new inventions. Many years practical experience in this line of work. Correspondence solicited.

Refer by special permission to proprietor of the AGE.

## ...SILK...

A JOURNAL PUBLISHED MONTHLY.

Devoted exclusively to the Raising of SILK and the Manufacture of the same. Only one dollar (\$1.00) a year.

Subscribe now. It contains information you ought to know.

Address,

SILK PUBLISHING COMPANY.

Tallulah Falls, Georgia.

## A NEW BOOK FOR INVENTORS.

Patents and How to Make

Money out of Them.

By W. B. HUTCHINSON.

This is the only book published, giving a detailed and full account, from the author's actual experience, of just what steps are necessary from the time the invention is conceived, to the time it is sold, with a clear and concise resume of the law and practice, legally and commercially, of trademarks and copyrights. It also tells accurately How and What to Invent, How to sell Inventions, Place them on the Market, Interest Capital in them, and to successfully Promote a Stock Company. It also contains an index of forms worth double the price of the book, to any one interested.

ELEGANTLY CLOTH BOUND.

GOLD STAMPED. \$1.00 Postpaid.

Sent with one subscription to AGE for \$1.75.

Or will sell separately.

Address— The Inventive Age Pub. Co.,  
918 F St., N. W. WASHINGTON, D. C.

## The Manhattan Typewriter,

Guaranteed to be of  
the Highest Grade

NOT IN THE TRUST.  
PRICE \$50.

JOHN C. PARKER,  
619 Seventh St. N.W., Washington, D. C.

## Magic Rheumatic Cure!

It absolutely does cure. It is not a cheap remedy but it is a cheap cure. Mark the distinction! There are a thousand remedies to one cure. This is a CURE. It costs \$2.00 a bottle, and is worth \$20.00 to any sufferer. Sold only by our authorized agents or direct of us. Send for circular. Agents wanted.

MAGIC CURE CO.

R. 313-315 Dearborn St. Chicago.

SEND 5 cents in stamps and we will mail you one of our Red Rope Pocket Books Wear like leather.

FRED. B. NICHOLS & CO.,

913 E St., N. W.,

Wholesale Stationers, Washington, D. C.



THE INVENTIVE AGE PUBLISHING CO., Washington, D. C.

I herewith enclose \$1.00 for one year's subscription to

## "THE INVENTIVE AGE."

I also enclose ad. for insertion in the (Patents for Sale\*) (Want\*) column of your paper.

NAME.....

P. O.....

STATE.....

\*Please indicate in which column you want the ad. inserted.

N. B.—Remit in any way most convenient.

Every subscriber is entitled to a free advertisement, not exceeding five lines, of any patent in which he may be interested. The ad will be inserted three times.



# The Inventive Age

## AND PATENT INDEX.

Established 1889.

### INVENTIVE AGE PUBLISHING CO.,

National Union Building, 918 F Street, N. W.,  
WASHINGTON, D. C.

The INVENTIVE AGE is sent, postage prepaid, to any address in the United States, Canada, Mexico, Hawaii, and Porto Rico, for ONE DOLLAR a year; to any other country, postage prepaid, ONE DOLLAR AND A HALF.

Correspondence with inventors, mechanics, patentees, and manufacturers, is invited. The columns of this journal are open for the discussion of such subjects as are of general interest to its readers.

Technical matter is particularly desired. We want practical information from practical men.

The INVENTIVE AGE is independent.

Special facilities for furnishing cuts of any patented device together with descriptive article. Business specials 15 cents a line each insertion; 7 words to the line. No advertisement less than 25 cents.

Address all communications to  
THE INVENTIVE AGE PUBLISHING COMPANY,  
WASHINGTON, D. C.

Entered at the Post-office as 2nd class matter.

WASHINGTON DECEMBER, 1903

### Transmitting Writing by Wire.

The "telechirograph" is the rather complicated name given to an instrument of remarkable character that has just been patented by a young inventor, Ernst Karl Gruhn. It is a device to transmit, over an ordinary telephone wire, a written message, reproducing every trait and peculiarity of the sender's hand writing. The telechirograph has been used successfully over a 200-mile circuit, and there seems no good reason why it should not be used with equal success over a 2,000 mile circuit, when such an arrangement comes into general use.

The transmitter is not unlike that used for the telephone. It consists of a metallic pencil holder, to which are attached two wires, each being part of an independent closed electric circuit. When not in use, the pencil lies in a rest which opens a switch, breaking both circuits—in much the same manner as the "receiver" hangs in a rest on the ordinary telephone, and by its weight opens the switch and breaks the current. When taken out of the rest, the switch is closed, and the current thus set in motion lights a small incandescent lamp in the receiving instrument, and the apparatus is then ready for use.

In the end of the metallic pencil is placed an ordinary piece of pencil lead, which can be moved slightly in and out. The writing may be done on any piece of paper that is convenient. When writing, the pressure of the pencil on the paper closes an electric circuit in the interior of the pencil holder. An arrangement is provided such as tradesmen use in writing purchase slips, which shows a square of paper in a tablet or slate, on which the desired message may be inscribed. The up-and-down motion of the pencil in writing sets in action what electricians call the ordinate current, and the left-to-right motion starts the horizontal-motion current.

In ordinary writing, both currents

are called into action to a greater or less extent. If the pencil is placed at the extreme top of the pad, the minimum degree of intensity in the ordinate current is produced, and if placed at the bottom of the pad, the maximum degree of intensity. In the same way, if the pencil be pressed on the extreme left of the pad, the minimum degree of intensity the horizontal current is generated, and the maximum if it is pressed on the extreme right of the pad. The currents thus affected are what are known as closed or continuous, being the same as are used in the telephone, as distinguished from the open circuits in the Morse telegraph.

At the other end of the line, in the receiver, a small mirror is provided, supported on three points, two of which are movable, so that the mirror can be turned or rocked at any angle. In the back of the mirror are two magnets, controlled respectively by the horizontal and vertical motion currents just described. The light from the lamp, passed through a concentrating lens, produces a compact bundle or pencil of light rays, which fall on the mirror. The mirror, in response to the magnets, moves in exact correspondence with the movements of the pencil at the other end. The ray of light, deflected upon the strip of sensitized photographic paper, follows the movements of the writer's hand, and produces on the sensitized film an exact fac-simile of the pencil markings at the transmitting instrument.

After the message has been written, the metallic pencil is replaced in its rest at the transmitting instrument, and the circuit is broken. The light in the receiving apparatus then goes out, and an electric motor, operated by an independent battery in the receiving instrument, is set in motion. This motor operates a train of wheels or rollers which draw the portion of the film written upon by the light ray through a developing bath and out again through a pair of rubber drying rolls, so that the complete message is delivered about thirty-five seconds after the sender replaces the metallic pencil in its rest. The entire apparatus can be placed in a box thirteen inches wide, fifteen inches long, and thirteen inches high.

It may be thought that, however interesting, this invention will not be of much value to the world, inasmuch as most people would be content with the transmission of their thoughts by telephone or telegraph, and would care little about the preservation of the exact form of chirography. But the invention has other applications. It reproduces drawing as well as writing, and it will be possible for the detective of the future, wishing to transmit a description of a criminal to some distant point, to identify him by means of a sketch that will be received by the police within a little more than half a minute after it is sent, avoiding the necessity of waiting for the pleasure of the mails. For newspaper artists, too, it will be invaluable. With further development of the possibilities of the instrument, we can imagine ourselves examining pictures of a battle on the very day that it occurs, the sketches having been made on the spot and telechirographed to catch the first edition of the evening newspaper.

### The New Army Rifle.

The new rifle which has been adopted for use in the army, will also, it is stated, be employed by the navy and the militia of the United States. It uses a rimless cartridge. The weight of the bullet is 220 grains, and that of the powder charge 44.5 grains. The powder pressure is 42,000 pounds to the square inch, and the muzzle velocity 2,300 feet a second. The magazine can be charged from a clip by inserting either end of the clip in a seat in the rear of the receiver, and by forcing the cartridges from it directly into the magazine by pressure of the right thumb on the top of the cartridge. The clip is ejected by the forward motion of the bolt. The gun can be used as a single loader with the magazine empty, and if the magazine is partly empty, it can be filled by the insertion of single cartridges.

The experimental rifle, with the 24 inch barrel and rod bayonet, weighs two pounds less than the present service arm, with its bayonet and bayonet scabbard. The penetration in pine of the former, up to 15,000 yards, is about 50 per cent greater than that of the latter; and the accuracy of the former is 14 per cent greater at 500 yards, than that of the latter.

This rifle, it is reported, has triumphed in the most ingenious tests that could be devised by a board of infantry and cavalry officers. In an extensive test of rapid firing at 100 yards, marksmen kneeling or prone, a general average of 12 shots a minute gave an advantage to the new gun over the service weapon of 9.3 per cent in rapidity and 18.6 per cent of hits. Altogether, it is much more effective than the present service arm.

### Irrecoverable Waste.

The utilization of what formerly were considered waste products and the resurrection of materials from a used-up state to a new condition of serviceableness have, in recent times, been developed to such a degree of completeness that we are scarcely prepared to admit that anything is ever irrecoverably lost. In this respect we believe in the conservation of materials just as we have long been taught to believe in the law of conservation of energy. From a purely practical point of view, however, some things certainly may be so completely lost to further use that their loss may well be considered absolute, and one of these is the metal lost in the wear of railway stock brasses. For the speculator in copper values, the promoter of a copper "corner," to use the broker's cant, the copper which has gone into railway brasses need have no terrors. It is not likely ever to be available again in full measure. It is dissipated so completely, in part at least, that its practical recovery is not likely to receive much serious consideration. From the best available deductions on the subject it appears that 5 per cent of the annual copper production of the world disappears in this way every year—*Cassier's Magazine.*

### The Outlook for Wireless Telegraphy.

It is now three years since we were promised in no qualified terms transatlantic wireless telegraphy. At intervals that may be said to have corresponded more or less with marked depression in the wireless stock market, these promises have been repeated with increased emphasis; and in full page advertisements the public has, among other things, been informed as to the exact prospective earning capacity of each transatlantic wireless circuit, which earnings never fail to show a clear 10 per cent. profit annually on the entire capital stock of the company. These earnings, be it pointed out, are based on the possible earnings of a circuit working every hour of the year at a rate about equal to the best speed of the Atlantic cables, which is assuming a maximum of business to be handled which the Atlantic cables have not yet found forthcoming. Probably these cables are not operated to their full capacity more than five-sixths of the time, exclusive of Sundays. The comparison is also made with the cable service as if transatlantic wireless telegraphy were an accomplished fact, whereas not only is this not so, but there is probably not at present a single wireless telegraphic circuit in any part of the world where the business offered for transmission is sufficient to keep it occupied every hour of the twenty-four at the rate of speed mentioned, nor is it likely that there is in operation today anywhere a system of wireless telegraphy that can be relied on to work without interruption twenty-four hours of the day,—all of which is said without desiring to detract in the slightest degree from the immense importance of wireless telegraphy in its proper sphere. But the foregoing facts profiteth the advertising and press agents of wireless telegraphy nothing. Their business is to facilitate the transmission of stock to the pockets of prospective investors, and indeed,—we trust the remark will not be considered unkind,—this appears to be the part of the business now being most energetically carried on by many of the promoters of wireless telegraphy.

The rein which some of these gentlemen give to their imagination is well exemplified in one instance where an installation consisting of a flag pole, a wooden building of the dimensions of an automobile shed, containing a small oil engine, a dynamo machine and the other ordinary apparatus of a wireless outfit, are alluded to as "a magnificent station" at Blanktown. When, however, the short time that has elapsed since wireless telegraphy was introduced as a new art is considered, one wonders not so much that transatlantic wireless telegraphy is not yet an assured practical success, but that the art has already attained a degree of practicability whereby it is possible to communicate between passing vessels, and vessels and the shore, with fair regularity and precision. For these results unstinted credit should be given to the inventors of the various systems; and it is, perhaps, quite possible that if these inventors were allowed to pursue their preliminary investigations and experiments to a conclusion without undue pressure to show immediate practical results of some kind, the actual progress would doubtless have been even greater than it has been. Sooner or later the possibilities and limitations of this art will be better understood, at which time it will be assigned to the work for which it is pre eminently adapted, and the brain-wearing attempts to show its adaptability to purposes which are already better performed by other methods, will be abandoned. —*Cassier's Magazine.*



## SCIENTIFIC

## PROGRESS.

## Sharpening Razors.

Some time ago a patent was obtained on sharpening razors and other implements having keen edges by means of magnetism, the inventor of the original idea placing a bar of magnet in line with, and spaced from, the edge. He claimed that this would tend to align the minute ragged teeth, which an examination under a microscope has shown to be the make-up of the cutting edges. Further experiment has shown a tendency of the magnet to draw toward the poles, and consequently the tendency is to improve only parts of the edge. On the other hand, Mr. Theron Davis, of New York, N. Y., has found that by magnetizing the edged tool, and then holding a bar of soft iron or other attractive metal opposite the edge, the magnetic attraction is exerted the entire length of the same and a uniform sharpening is obtained. This improvement which is practically a reversal of the original idea has recently been patented by Mr. Davis.

## Testing Wine by Telephone.

A member of the Paris Faculty of Sciences has discovered an ingenious way of testing wine—by telephone. He has an infallible method of ascertaining by the use of the 'phone how much a given quantity of wine has been watered. The principle upon which the invention rests is the variable conductivity of different liquids, notably of wine and water.

The originality of the application is the Frenchman's use of the telephone to determine to what degree the liquid under observation is a conductor. He has constructed an apparatus which achieves this object satisfactorily and accurately. By means of a chart, on which are set down in tabular form the results of various necessary calculations made for the purpose, an operator with the telephone can easily read out the exact proportion of water in the wine he is testing, whereas the chemical analysis processes hitherto employed are lengthy, laborious and costly.

The apparatus works as follows: Two vessels, one containing wine known to be pure, and the other the same quantity of wine to be tested, are placed on an instrument which looks like a pair of scales. The telephone is in contact with both liquids. If the sample of wine under observation is as pure as the standard used for comparison, no sound is heard; if, on the contrary, it contains water, the telltale telephone "speaks" and the greater the proportion of water, the louder the instrument complains. A dial on which a number of figures are marked is connected with the telephone. To ascertain the proportion of water in the wine, the operator moves a hand on the dial until the telephone, which has been sounding all this time, relapses into silence. The hand has thus been brought to a certain figure on the dial. This number is looked up in a chart, which the ingenious inventor has drawn up, and

corresponding to it is found indicated the exact proportion of water contained in the quantity of wine.

This remarkable invention can, the designer says, be easily applied to the testing of many other liquids and even solids, which may be adulterated by the addition of foreign matter possessing a conductivity different from that of the original substance. Unscrupulous dealers will certainly not have cause to bless the inventor.

## Electric Signs.

Means for Operating Electric Signs is the subject matter of a patent granted to William Goltz, of Chicago, Ill. Heretofore to produce intermittent illumination it has been customary to intermittently interrupt the supply-current to the lamps to be illuminated by making and breaking the circuit through which the current flows—as for example, by means of stationary contacts bearing on interrupted contacts mounted upon a revolving drum or disk. It is evident that this method of operation causes objectionable sparking as the supply-circuits are broken, and is consequently detrimental to the contacts which become burned and burred, requiring considerable attention and repair to insure efficient and economical operation of the illuminated lamps. Furthermore, when a great number of lamps are thus suddenly connected into circuit, there is apt to be considerable blowing of fuses and other protective devices.

It is the object of Mr. Goltz in the present invention to employ means for operating the lamps without breaking the circuit, thus eliminating all injurious sparking. Another feature is the provision of means whereby the lamps of an electric sign may be suddenly fully illuminated, and remain at full illumination long enough to be read and then suddenly darkened.

A motive source, preferably a motor, connects by means of a belt with a train of reduction-gearing consisting of a pulley, carrying a belt, a worm, mounted on a common shaft with the pulley and engaging a worm-wheel, a second worm on a common shaft with the worm-wheel and another worm-wheel engaged by said second worm, all mounted in suitable bearings. A crank mounted in common with the second worm-wheel transmits oscillatory motion to a contact-lever on a dimmer by means of a connecting rod. Said lever is pivoted at its center, its ends being adapted to travel over resistance terminals. The connecting-rod so engages the lever that as the crank revolves said lever will oscillate between the limits of resistance terminals. The high rate of revolution of the motor may thus be reduced to any desired rate of oscillation of the lever on the dimmer, controlling the illumination of the lamps on the sign. When the lever is at the ends of oscillation, the lamps are either dark or at full candle-power, and the connecting-rod-bearing centers and the crank-shaft center will lie in the same plane. The crank end may move a considerable distance either side of this plane without causing enough motion of the lever ends to perceptibly affect the illumination. In fact, it may be said that the lever ends have harmonic motion. If it is desired to have full candle-power illumination continue a greater length of time, the corresponding end-resistance terminal may be lengthened to give prolonged or lingering contact.

## New Iron Hardening Process.

Phosphorus, as is well known, has the property of imparting a certain degree of surface hardening to iron, but not without producing brittleness. The iron is made to assume a coarse structure, in which the crystals are comparatively loosely bound together. This effect of phosphorus of loosening the coherence of the molecules of the iron greatly facilitates the absorption of carbon by the iron. The carbon rapidly penetrates the iron to a considerable depth, imparting great toughness to the core and nullifying the comparatively slight defect constituted by the inconsiderable brittleness of the surface. Two Prussian inventors apply this principle in their process for hardening iron by heating the same in a tempering powder consisting of organic nitrogenous substances containing a high percentage of fusible ash, and employing phosphorus as the medium for the introduction of carbon into the iron. Without prejudicially affecting the welding properties of the iron, it imparts such a degree of hardness thereto that it can neither be cut nor chipped by the best steel used. In order to harden the surface of about 441 pounds of iron to a depth of 0.0394 inch by means of this process, the pieces should be embedded in a retort, muffle, or the like, in bone dust, to which is added a mixture of 300 grains of yellow prussiate, 250 grains of cyanide of potassium, and 400 grains of phosphorus. The receptacle is well closed, luted with clay, etc., and raised to a clear red or white heat, whereupon the material treated is immersed in a glowing condition in a water or other bath.

## An Electrical Incubator.

Mr. Frank C. Perkins, of Buffalo, N. Y., is the inventor of a novel electrical incubator, the object of which is to provide an incubator in which eggs are hatched and chicks are kept warm by means of an electric heater, which, together with a thermostatic regulator, is arranged directly within the incubating-chamber. Another object of the invention is to provide simple automatic means for turning the eggs and also cooling the same periodically. The incubator is furthermore so organized that the eggs may be readily tested without removing the same from the incubator.

An incubating chamber is provided in which is arranged an oscillating egg-tray which is shifted by electromagnets having their magnets connected with opposite ends of the tray. An electric heater is also arranged in said chamber and is connected on one side with one end of the magnet coils. Arranged in said chamber and interposed between one pole of an electric generator and the heater, is a thermostat. A rotary contact-arm is connected with the other pole of said generator, and on opposite sides of said contact-arm are arranged a pair of magnet-contacts which are connected respectively with the opposite ends of the magnet-coils. Segmental contacts are arranged around the magnet-contacts and alternate with

the same, and are connected with that side of the heater opposite the thermostat. An insulating-section is arranged between two adjacent contacts, which are adapted to be successively engaged by the contact-arm during its rotary movement.

## Fatalities from Electricity.

When fatalities or damages seemingly attributable to electricity occur, the popular belief is that electricity itself, as a force, is directly responsible for them. In fact, however, there are few forces of nature that are less harmful in themselves than electricity. The damage done by flood or tornado, for instance, is done directly by the water or the air. But electricity, when it works, usually does so indirectly or by setting another of nature's forces into operation. An exception to this may be where the victim may have been so weak, physiologically, that a simple fall from a chair might have had a similar result. But in the majority of cases death from electric shock is shown to be due to well-defined chemical changes in the blood or tissues, due to the electric current. The damage done also to gas and water pipes by electrolysis, whilst primarily occasioned, it is true, by the escape of electricity from electric railway circuits, is not directly due to that force, but rather to a secondary action, and that a purely chemical one, namely, the setting free by electrical action of certain elements, such as chlorine and sodium, constituents of a saline solution in the soil, which attack and corrode the iron pipes. Without some such solution in the soil there would be no such thing as electrolysis. Also, when lightning strikes a tree and shatters it, the result is not due directly to electricity, and not even to the electric current, but rather to the intense heat which the electric current generates in passing through the tree, which heat suddenly converts the sap into steam, and the latter in expanding, if the force be sufficient, tears the tree to pieces. If the force is not sufficiently powerful, the effect may be only to loosen the bark of the tree in places, the evidence of which may last for years, but may not be otherwise hurtful to the tree's growth. So far, indeed, from electricity being necessarily fatal to animal or vegetable life, it is well known that in proper quantities it is decidedly beneficial, and, when properly applied, acts as a stimulus to vegetation. An excess of current, however, will also kill vegetation. In both of these cases its action is due to the chemical changes which it effects in the growing plant or tree.

The injuries to shade trees by contact with wires carrying heavy currents, such as electric light or traction wires, is mostly mechanical, an arc forming at the point of contact of the wire with the branch or limb and burning away the wood, leaving the tree stunted at such places. In very stormy, wet weather, it is not uncommon to have large trees set on fire by the escape of current from abutting electric light wires, the rain, paradoxical as it may seem, by improving the conductivity of the circuit down the tree to the earth, virtually adding fuel to the flames.—*Cassier's Magazine*



**A** CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies for \$1.50.—Please give correct data in ordering.—Address

THE INVENTIVE AGE PUBLISHING CO., 918 F St., N. W., Washington, D. C.

## LIST OF PATENTS

Issued October 27, 1903.

### MECHANICAL PATENTS.

- Adding register..... H. G. White  
Adhesives. Making..... C. D. Ekman  
Advertising and check protecting device Combined..... A. A. Root  
Advertising device. Electric..... G. W. Enright  
Advertising display card and carton holder..... L. C. Witkowski  
Air brake..... J. H. Biege  
Air brake and signal system..... T. J. Quirk  
Air brake. Automatic..... C. H. Nelson  
Alcohol. Making trichloroisopropyl..... F. Holmann et al  
Amber, ambroid, or the like, in mass, cigarette holders, pipe stems, &c. Producing from..... E. Simon  
Angle finder..... J. A. Traut  
Animal shears..... H. V. Dunn  
Animal trap..... C. W. Gillis  
Annunciator. Line..... H. P. Clausen  
Autocar dust guard..... W. H. Brown  
Automatic coupling..... F. M. & H. C. Harvey  
Automatic indicator..... W. E. Laird  
Awning..... J. O. Sorensen  
Bag. Hand or like containing..... W. W. McCormick  
Bag holder..... P. Brown  
Ballot box. Secret..... H. J. Fox  
Bearing for centrifugal machines. Spring neck..... J. H. Fleming et al  
Beating or whisking device..... W. R. & N. B. Cain  
Bed Spring..... J. W. Terry  
Belt. Apparel..... M. Scherer  
Bicycle handle bar..... H. Ruppel et al  
Blower..... T. M. Eynon  
Boat. Miniature or toy submarine..... A. F. Humphrey  
Boats, &c. Lifting apparatus for raising or lowering canal..... R. Krell  
Bodkin..... G. J. Dixon  
Boiler..... O. S. Garrettson  
Boiler..... J. M. McClellon  
Boiler draft attachment. Locomotive..... J. J. DeLancey  
Book. Manifold sales..... C. Fester  
Boots or shoes. Making..... H. Alberts  
Bottle carrier for testers..... T. L. Valerius  
Bottle. Non refillable..... M. C. Johnson  
Bottle. Non refillable..... H. A. Clinton  
Bottle rinsing machine..... F. N. Young  
Bottle stoppering device..... W. R. Green  
Box..... I. W. Allen  
Box covering and corner staying machine..... T. Morgan  
Box fastener..... C. W. Beehler  
Boxes. Apparatus for the manufacture of card board..... K. E. Beschoner  
Brackets, &c. Support for..... H. F. Keil  
Brake beam..... H. C. Baboup  
Brake beam fulcrum..... G. B. F. Cooper  
Brick. Machine for making sand or chemical..... C. W. Boyle  
Broom rack..... F. F. Butch  
Buckle. Trace..... G. W. Williams  
Buggy boot..... J. W. Simmons  
Buggy. Storm..... R. Heinzelman  
Button. Bar..... E. L. Ashley  
Cabinet. Record..... H. D. Hermany  
Cabinet. Record..... L. Nevins  
Cables or wires. Ground anchor for A. Barse  
Can opener..... R. O. Hammond  
Canned goods. Apparatus for treating..... R. B. Polk  
Cant hook..... W. O. Leduc  
Car brake..... C. P. Moran  
Car brake beam. Railway..... S. A. Crone  
Car coupling..... J. W. Barth  
Car coupling. Automatic..... J. W. Barth  
Car door. Grain..... C. L. Robbing  
Car frame. Motor..... P. Arbel  
Car heater. Electric..... E. E. Gold  
Car mover..... N. E. Bunting  
Car reflector. Street..... F. M. Livingston  
Car replacer..... A. Bouvier  
Carbon chords. Producing..... F. J. Machalske  
Carbon sheet or paper holder, lifter, and separator..... G. W. Donning  
Carboy holder..... H. A. Dorr  
Carburetor..... G. L. Hogan  
Carburetor..... B. de Laite  
Carburetor..... E. Walther  
Card clamp..... F. H. Stewart et al  
Card punching or stamping machine..... W. W. Hodgson  
Carriage door handle..... J. C. Konrad  
Cart or other vehicle..... T. Hill  
Cartridge shell resizing, decapping and re-capping apparatus..... E. L. Wetzgi  
Cast steel wheel..... J. P. S. Lawrence  
Caster and socket..... B. H. Noelting  
Cement mixer..... W. Clark  
Chain link..... A. Drost  
Char drier..... G. M. Newhall  
Chip rack..... A. Blach  
Churn dasher..... J. W. Morris  
Cigarette box, &c..... S. L. Feiber  
Cigarette machines. Creasing device for continuous..... F. J. Ledington  
Clip or fastener..... J. A. Budworth  
Clothes rack..... M. S. Churchill  
Clothes reel..... P. K. Young  
Clutch..... P. E. Varney  
Clutch for drilling swivels. Ratchet..... J. Kuny et al  
Clutch. Friction..... E. J. Moore  
Clutch. Friction..... C. E. Torrance  
Clutch mechanism. Lever actuated interlocking..... B. W. Grist  
Coal screen..... J. P. Burke  
Coffee roaster..... C. Constine  
Coiling machine..... A. Schweitzer et al  
Coin receptacle..... J. A. Steinmetz  
Collars. Manufacturing..... G. J. Dormandy  
Column, girder, or structure. Metal E. Zeh et al  
Combing machine..... I. Hey  
Commutator..... C. J. Roach  
Concentrator..... C. H. Snow  
Concrete post mold..... H. H. Clough  
Convertible device..... W. L. Bear  
Conveyor. Portable..... W. L. McCabe  
Conveyers. Rope carrier for movable bucket..... G. E. Titcomb  
Cork washer or disk and making same..... C. D. Armstrong  
Corn husker. Green..... C. H. Deering et al  
Corn husking implement..... G. Marshall  
Corn husking rolls. Agitator for..... C. G. Bort  
Corn sorter. Seed..... L. P. Graham  
Corset skirt hook attachment..... M. B. Hammond  
Cotarnin phthalate and making same H. Vieth  
Coupling device. Auxiliary..... C. H. McLaughlin  
Crate filler..... W. A. Melrose  
Crochet form..... A. J. Barber  
Crystallizing apparatus..... H. Winter  
Cuff holder..... M. L. Hawks  
Cultivators. Adjustable arch for H. B. Porter  
Curtain fixture..... P. G. Emery  
Cutter head..... C. Seewald  
Cutting machine. Vertical feed transverse..... C. W. H. Blood  
Dental engines. Circuit controller for surgical..... W. W. Alexander  
Dental filling tool..... H. P. Kelly  
Dental jaw prop..... E. L. Mason  
Dental or other uses. Blast controlling device for..... N. K. Garhart  
Disintegrator..... E. S. Peck  
Distilling apparatus. Turpentine J. I. Pittman  
Door..... A. Ritter  
Draft equalizer..... P. E. Little  
Draft equalizer..... M. F. Richardson  
Draft evener..... F. J. Schulz  
Draft rigging. Friction..... J. C. Herrmann  
Draw gear and buffing apparatus..... W. S. Jones  
Drawer pull stud..... D. W. Tower  
Drier..... E. S. Peck  
Drier..... R. F. Wentz  
Drying industrial wastes. Apparatus for..... E. Lowi  
Driveway gate..... C. Nielsen  
Duck call..... A. R. Kahlemer  
Dye and making same. Blue sulfur..... R. Heiz  
Eaves trough hanger..... H. E. Adams et al  
Egg beater..... B. E. Weber  
Electric carrying apparatus..... J. J. Hill  
Electric furnace..... H. Harmet  
Electric lighter..... C. Hubert  
Electric machine or motor. Dynamo..... E. R. Cox, Jr  
Electric meter prepayment attachment..... H. A. Robertson  
Electric motor..... J. H. Blair  
Electric pocket for lighting purposes A. Olenin  
Electrical conduit. Split..... E. N. Lake  
Electrical diverter..... A. C. Gilgen  
Electrodynamical equipment for schools..... H. J. Evans et al  
Electrolytic apparatus..... W. M. Johnson  
Electrolytic reduction of organic compounds by means of titanium compounds..... M. Moest et al  
Electrotyping mechanism..... C. W. Eberhard  
Elevator brake..... J. Gavelek  
Elevator car operating device..... P. F. Foley  
Elevator mechanism..... J. Dillon  
Elevator safety device..... F. H. Wilson  
Elevator safety device..... W. & J. Floss  
Engine..... A. W. Ofeldt  
Engine mixer. Hydrocarbon C. C. Chamberlain  
Engine speed regulator. Kerosene oil..... F. C. Hirsch  
Engine starter. Automatic gas G. S. Billman  
Engines. Exhaust coupling for double cylinder..... E. B. Gallaher  
Engineer's alarm. Locomotive..... E. Watson  
Engraving machine cipher type A. E. Francis  
Envelope opener, folder, and rule. Combination..... D. K. Alden  
Erasing shield..... J. M. Keep  
Exercising device..... W. H. Chellis et al  
Eyeglass spring. Folding..... F. Birkenstein  
Eyeglasses..... B. M. Levey  
Faucet..... J. G. Huye  
Feed water heater..... S. E. Flint  
Feeder. Boiler..... H. J. Davis et al  
Fifth wheel. Vehicle..... G. W. Way  
Filter. Water..... A. F. Stern  
Fire alarm and fire escape..... T. S. Philpott et al  
Fire extinguisher..... E. J. Buckland  
Fireproof blind roller..... W. M. Brunst  
Fireproof blind roller..... J. Volp  
Fireproofing construction W. F. Wilmoth et al  
Fish or land animals. Apparatus for supplying food to..... H. S. Hale  
Fish or land animals. Machine for supplying food to..... H. S. Hale  
Fishing bait and preparing same..... T. H. Curtis et al  
Fishing net..... A. E. Butler  
Fishing reel..... H. E. Van Alstyne  
Fishing reel..... A. J. Arund  
Fishing reel..... H. B. Carlton et al  
Flower stand..... F. Strubs  
Flowers and making same. Tubular stalk for artificial..... J. Jacobson  
Fluid fuel heater and pumping system..... R. G. Kirkwood  
Fluid holder and dispenser..... P. Lindemeyer  
Fly or insect trap..... J. A. Francis  
Fly wheel..... J. F. Radebaugh  
Folding box..... W. E. Burton  
Folding box..... G. L. Morrison  
Folding box or crate..... A. J. Coghe  
Folding machine..... W. Downing  
Food. Slaughtering cattle..... A. Clarke  
Friction element..... K. G. Laub  
Friction top can..... H. H. Hull  
Fruit gatherer..... J. Hopkins  
Furnace..... F. J. Doyle  
Furnace botting apparatus..... M. Killen et al  
Furnace charging and cleaning apparatus..... T. Jones  
Furnace cleaning apparatus..... T. Jones  
Furnace with automatic feeding..... W. Josten  
Furnaces. Air heating apparatus for reverberatory..... J. Renleaux  
Furniture..... J. A. Staples  
Furniture brace..... J. L. White  
Furniture fastening device..... D. W. Tower  
Furniture. Means for securing casters to..... C. F. Wheeler  
Fuse switch box. Electric..... J. Sachs  
Galvanic battery..... C. W. Roberts  
Galvanic cell..... W. Strickland  
Game..... G. P. Hall  
Game..... E. H. Roy  
Garbage. Treating..... 2 pats. E. S. Peck  
Garbage. Treating..... E. S. Peck et al  
Garment hanger..... A. Mieden  
Garment supporter..... O. Kraus  
Gas burner..... W. Collins  
Gas burner. Incandescent..... J. Harris  
Gas furnace. Recuperator K. M. Mitchell et al  
Gas generator. Acetylene..... J. A. Mosher  
Gas. Manufacturing..... A. M. Gow  
Gas manufacturing apparatus..... A. M. Gow  
Gas supply system regulator..... R. M. Dixon  
Gasoline engine..... R. R. Gaskill  
Gate..... S. Ware  
Gearing..... P. B. T. Berner  
Gearing..... A. Winton  
Glass articles. Manufacturing hollow..... P. T. Sievert  
Glass blowing apparatus..... P. T. Sievert  
Glass blowing machine..... E. S. Hutton  
Glass cutter..... F. S. Fletcher  
Glass drawing machine..... G. H. Harvey  
Glass finishing apparatus..... J. H. Crosby  
Glass reflectors. Making..... O. A. Mygatt  
Glassware. Finishing..... J. H. Crosby  
Governor for steam engines or pumps. Automatic pressure actuated..... J. H. Clark  
Governor spindle actuating device..... G. B. Petsche  
Grain divider..... J. W. Pridmore  
Grain scouter and cleaner..... C. Stone  
Gramophone reproducer support E. R. Johnson  
Grate attachment..... W. A. Moreland  
Grate. Shaking..... G. A. Gumpert  
Grinding mill..... P. E. Hodgkin et al  
Grinding or polishing machine..... J. B. Lobet  
Gun. Air..... D. F. Polley  
Gun. Rapid fire..... J. F. Meigs et al  
Hair crimper..... C. R. Linthicum  
Hammer or tool. Magazine..... G. C. Fuller  
Harness..... T. Manners  
Harrow..... O. C. Vaughn  
Harrow..... N. W. Thompson  
Harvester attachment for saving and securing down grain..... W. M. Wadleigh  
Harvester. Beet..... E. Beer et al  
Harvester reel..... L. V. Axtell  
Harvesting machine..... J. F. Steward  
Hat fastener. Lady's..... E. Weissmann  
Hat. Folding..... R. Plato  
Hay and stock rack. Convertible..... J. L. Staley  
Heat alarm..... H. F. Jones  
Heating boiler..... A. Scholl  
Hinge. Gate..... L. F. Volberding  
Hoist. Chain..... T. A. Weston  
Hoisting, &c. Drum for..... C. W. Hunt  
Hoisting hook. Safety..... J. M. Ward  
Hoisting or hauling drum..... A. McNamara  
Holeback. Vehicle..... J. C. Joyce  
Hook and eye..... C. C. Mund  
Hook and eye..... P. M. Kling  
Horse blanket..... G. A. Bulles  
Horse blankets. Tail wrapper and crupper for..... G. A. Bulles  
Horse nose band..... M. Purcell  
Horse stock..... M. T. Bransfield  
Horseshoe..... J. MacLean  
Horseshoe. Elastic..... E. J. Sinnott  
Horseshoe. Nailless..... C. W. Smith  
Horseshoe sharpening and calking device..... H. A. Hess  
Hose coupling..... J. Homola  
Hose cut off compressor..... E. Horsey  
Hose supporter..... W. L. Myers  
Hot air currents and liquid spray. Machine for producing..... J. C. Sherburne  
Hydrocarbon burner..... H. J. Myers  
Hydrocarbon burner..... J. B. & H. V. Gorrell  
Hydrocarbon burner..... O. Falkenwalde  
Ice cream freezer operating mechanism..... W. T. Mosher  
Ice machine..... C. C. Palmer  
Ice machine..... T. H. Butler  
Ice machine freezing tank..... T. H. Butler  
Ice table..... T. H. Butler  
Index tag. Movable..... F. G. Echorn  
Inking plate for job presses..... F. W. Weber  
Interlooped fabric..... F. Maussner  
Internal combustion engine..... L. Roedel  
Internal combustion engine..... O. P. Ostergren  
Iron and steel. Electrometallurgy of..... H. Harmet  
Jack..... L. A. Conner, Jr  
Jar closure tightening attachment..... G. M. Hughes  
Jar holder..... A. Roesch  
Jar or bottle closure..... J. Hirst  
Journal box dust guard..... J. W. Stephenson  
Knitting machine. Fancy..... G. A. Sanders  
Knitting machines. Feed circle for circular..... R. W. Gormly  
Lacing..... E. C. Chapman  
Ladders, &c. Extension foot for..... T. L. Charles  
Lamp burner..... C. Eches  
Lamp burner..... W. S. Hamm  
Lamp. Convertible signal..... W. S. Hamm  
Lamp. Electric arc..... G. R. Davidson  
Lamp. Electric arc..... 2 pats. J. Melzer  
Lamp fixture. Incandescent gas. J. L. Black  
Lamp. Gas..... H. H. Rountree et al  
Lamp socket. Electric..... M. Norden  
Lamps, &c. Hanger for electric..... M. C. Donahue  
Last distributor..... J. J. Hopkins  
Latch..... J. C. Foster  
Lathe attachment..... J. W. Bronaugh, Jr  
Lathe center grinder..... T. H. Coulter  
Lighter..... R. Thayer  
Liquid fuel heater burner..... M. G. Lewis  
Liquid supply rolls. Controlling device for..... W. Spalckhaver  
Lock case..... W. H. Taylor  
Locomotive engine..... J. Holden et al  
Locomotive engine cab heater..... G. C. Bailey  
Locomotive engines, &c. Sand distributing apparatus for..... J. Holden et al  
Locomotive tender gate..... H. O. McCain  
Loom box pattern mechanism..... F. A. & H. A. Guillelte  
Loom filling detecting mechanism..... A. E. Benson  
Loom multiplier mechanism..... W. G. Eaton  
Loom picker stick safety fastener..... H. W. Marcy  
Loom shuttle binder..... F. A. Mills  
Looms. Means for preventing banging off in..... E. S. Wood  
Lubricator..... W. S. Peavey  
Mail pouches from moving trains. Device for receiving..... J. Kaiser  
Massage instrument..... L. Casper  
Massaging implement..... J. B. Wantz  
Match safe. Pocket..... E. J. Moore  
Meat shaving machine..... J. W. Brown, Jr  
Medicament injector..... 2 pats. T. E. Hall  
Mercurous iodide. Soluble..... C. H. von Hoessle  
Metals. Electrodepositing..... W. M. Johnson  
Milk and making same. Dry condensed..... H. S. Hopkins  
Mill tester. Centrifugal..... W. E. Penn  
Milk tester. Centrifugal..... T. L. Valerius  
Mine timbering apparatus..... J. R. Hunter  
Mixing apparatus..... H. W. Blaisdell  
Mixing device..... W. S. Standish  
Motor wheel..... L. Peter  
Mower bunching attachment..... J. F. Steward  
Musical instruments. Means for regulating the expression of mechanical..... E. S. Votey  
Nut. Lock..... W. H. Block  
Nut lock..... A. & A. R. Marshall  
Nut lock..... F. N. Zimmerman  
Nut lock..... C. J. Ulbricht  
Oak lock..... C. M. Pray  
Oil burner feed..... A. W. Hess  
Oil feeding and storing system..... R. G. Kirkwood  
Oiler. Shaft..... R. B. Brown  
Ore scraper supporting and conveying apparatus..... G. H. Hulett  
Outdoor seat..... R. Billington, Jr  
Oven. Bake..... M. Hennings  
Oven. Baker's..... C. F. Igelmann  
Oven. Baker's reel..... C. F. Igelmann  
Ozonator..... J. Miller et al  
Package..... W. W. Bache  
Packing. Piston..... G. B. Fraley  
Painter's hook..... J. Hammarstrom  
Paper bag machine..... 2 pats. W. A. Lorenz  
Paper making machine..... T. H. Savery  
Paper making machine..... J. D. Tompkins  
Paper pasting and trimming machine. Wall..... O. E. Tharp  
Paper seam cutting and pasting machine. Wall..... J. Vogt  
Pen. Fountain..... J. Wheatley  
Phonographic records. Apparatus for reproducing..... T. B. Lambert  
Phonographic records. Reproducing..... T. B. Lambert  
Phonographs, &c. Actuating mechanism for..... C. C. Reinhardt  
Photographic apparatus..... R. Goldstein et al  
Photographic plate and making same..... A. Elchengrun et al  
Photographic printing apparatus..... L. Shaw  
Piano..... R. S. Bowen  
Piano card punching machine..... J. B. Davidson  
Pick lock..... W. E. Simmons  
Pin..... G. W. Dover  
Pin tongue joint..... C. W. Lord  
Pipe attachment. Water..... E. W. Stebbins  
Pipe coupling..... W. W. Price  
Pipe covering..... H. S. Lord  
Pipe wrench..... F. D. Bullard  
Pipes. Apparatus for the manufacture of lap-weld..... A. M. Saunders  
Plaster. Check row..... W. Conard  
Plaster. Hand..... J. L. Howard  
Plaster marker. Corn 2 pats. L. J. Lindsay  
Plumb, level, protractor, compass, and sun dial. Combined..... P. P. Moses  
Pneumatic carrier..... C. H. Burton  
Pneumatic despatch apparatus..... 5 pats. C. F. Stoddard  
Pneumatic service system..... E. L. Giles  
Pool ball rack and register..... E. R. Marshall  
Power transmitting mechanism L. H. Redetzke  
Primary battery..... J. A. Pedrazzi  
Printing black..... E. Ulrich et al  
Printing machine..... G. F. Read  
Printing machine. Multicolor and perfecting..... W. Spalckhaver  
Printing machine. Web..... W. Spalckhaver  
Printing press and embossing machine. Tip..... W. H. Lum  
Printing press blank or stock register..... C. G. Harris  
Printing press reel. Adjustable..... J. Sr. & F. H. Hoberg  
Printing. Producing surfaces for color..... J. Ramsdell  
Printing, type casting, &c. Machine for producing controllers for..... W. S. Timmis  
Propeller. Marine..... C. A. Manker  
Propelling mechanism. Vessel T. T. Timayenis  
Pulley..... F. L. Davis  
Pulley cover..... J. D. Kreisser  
Pulley. Expansible..... L. G. Rowand  
Pump..... G. Morrice et al  
Pump..... L. H. Williams  
Pump. Air..... G. H. Mohler  
Pump. Centrifugal..... A. C. E. Retau  
Pump. Deep well..... F. C. Kleinstiver  
Pump rods. Automatic coupling for sectional..... T. Costello, Jr. et al  
Pumping engine. Water..... A. W. Case  
Push button switch..... A. B. Simpson  
Puzzle..... W. S. Day  
Quick break switch..... H. Krantz  
Radiator. Sheet metal 3 pats. W. R. Kinnear  
Radiator. Tubular sheet metal W. R. Kinnear  
Rail joint..... W. H. Rehmet  
Rails. Means for lubricating street car..... E. K. Green  
Railway chart. Street..... M. Szekler



Railway cross tie ..... D. S. Affleck  
 Railway signaling device, Electric ..... H. Pfirrmann  
 Railway tie ..... O. Gerlach et al  
 Railway tie ..... C. M. Kirk  
 Railway tie, Metallic ..... F. U. Haymond et al  
 Railway tie trimming machine ..... J. Munroe  
 Railway track gage ..... T. L. Howell  
 Ratchet wrench ..... P. Harding  
 Razor and guard ..... J. H. Hilton  
 Razor guard, Safety ..... A. A. Lux  
 Razor stropping machine ..... F. R. & O. Kampfe  
 Reel ..... H. B. Carlton  
 Refrigerating apparatus Pressure and temperature regulator for the absorbers and return lines of ..... J. E. Starr  
 Refrigeration system, Mechanical car ..... W. H. Miller  
 Refrigerator building ..... J. Willis  
 Riding skirt ..... J. A. Odrak  
 Rivet ..... H. J. Maurer  
 Rolling mill ..... M. M. Suppes  
 Rolling mill ..... O. Heer  
 Rolling mill ingot manipulating mechanism ..... J. A. Hampton et al  
 Rolling mill rod adjusting mechanism ..... M. M. Suppes  
 Roof carline ..... G. B. Maltby  
 Roofing, Felt or fabric ..... B. G. Casler  
 Roofing, Tool for removing tin ..... J. C. Howley et al  
 Roost ..... H. Mattox  
 Rotary engine ..... F. Fuchs  
 Rotary engine ..... I. H. Dillon  
 Rotary engine ..... L. Teal  
 Rotary engine ..... T. E. E. Bartlett  
 Saddle, Spring supported ..... I. A. Newey  
 Saddles, collars, &c. Reversible pad for ..... F. Maussner  
 Safe day lock, Screw door ..... C. E. Blechschmidt  
 Safe cellar ..... W. Wood  
 Sash fastener ..... F. G. High  
 Sash lock Window ..... C. Heskys  
 Saw, Hot ..... P. C. Patterson  
 Saw machine, Band ..... M. Dixon  
 Sawmill carriage ..... G. F. Baxter  
 Scaffold ..... C. Uffelman  
 Scaffold Folding ..... T. E. derry  
 Scale ..... T. L. Richmond  
 Scenic apparatus ..... W. A. Hadden  
 Scissors holder ..... A. E. Moore  
 Scraper, Wheeled ..... W. S. Livengood  
 Scrubbing machine ..... B. Bowen  
 Separator ..... J. E. Foley  
 Sewed articles, Seam for ..... C. McNeill  
 Sewing machine cutter controlling mechanism, Buttonhole ..... T. O. Quist  
 Sewing machine folding guide ..... W. L. Swift  
 Sewing machine thread cutting device ..... J. J. Sullivan et al  
 Shade cord holder ..... G. Lange  
 Shade fixture, Window ..... J. Nicholas  
 Shear shears ..... R. F. Well  
 Sheet metal of cans, Means or apparatus for reclaiming the ..... C. J. Carroll  
 Shingle ..... J. L. M. Du Four  
 Shingle machine ..... E. L. Johnson  
 Ship's log ..... 2 pats. E. Nicholson  
 Shuck loader ..... C. W. Anderson  
 Shoe nailing machine ..... J. T. Crowe  
 Show case ..... J. S. Lewis et al  
 Siding gage ..... E. J. H. Blohm  
 Sight testing apparatus ..... G. Johnston  
 Sign, Electrically illuminated ..... J. H. Goehst  
 Signal or calling device ..... R. H. Ferguson  
 Signaling by electromagnetic waves ..... 2 pats. R. A. Fessenden  
 Sleigh runner ..... E. Perry  
 Slug and foot stick, Combined ..... A. D. Hostetter  
 Smelting furnace ..... O. H. Enel  
 Smelting furnace for the continuous production of steel ..... S. Surzyski  
 Smoke consumer ..... L. H. Snor  
 Smoke consuming furnace ..... L. C. Mooney  
 Snap ..... F. L. Loree  
 Soles, Machine for preparing boot or shoe ..... J. Keats  
 Spark arrester ..... J. W. Lyons  
 Speed mechanism, Variable ..... E. R. Seward  
 Spinning and doubling apparatus ..... 2 pats. T. Ashworth  
 Spinning machine ..... L. F. Weiss  
 Spittoon carrier and cleaner ..... H. Wenneborg, Jr  
 Spoon, Olive or pickle ..... A. H. Leach  
 Spring-work ..... J. A. Staples  
 Stacker hood, Pneumatic ..... J. N. Kallor  
 Stamp, Hand ..... B. B. Hill  
 Starch, Making soluble ..... C. H. Meyer  
 Steam boiler ..... F. X. Komarek  
 Steam boiler and furnace ..... F. J. Doyle  
 Steam generator ..... E. I. Nichols  
 Steam generator ..... D. Fitzgibbons  
 Steam trap ..... E. G. Gerrard  
 Steel, Apparatus for the manufacture of ..... H. Johnson  
 Sterilizer ..... R. P. Barnstead  
 Stethoscope ..... W. Jones  
 Still ..... S. B. Martin  
 Stone building blocks, Machine for making artificial ..... O. A. Hoyt  
 Stone column cutting machine ..... G. Bieh  
 Stop device, Adjustable marginal ..... G. W. Donning  
 Stopper lock ..... H. L. Leitch  
 Stove attachment, Blue flame oil ..... C. F. McKay  
 Stove, Downdraft ..... E. R. Cahoon  
 Stove, Heating and cooking ..... J. Harris  
 Strap covering machine ..... H. R. Chadbourne, Jr et al  
 Street cleaning machine ..... S. H. Seifeld  
 Structure, Composite ..... G. A. Weber  
 Sugar mixing apparatus ..... J. Czapikowski  
 Sulfuric anhydride and sulfuric acid by the contact process, Making ..... M. Schroeder  
 Surgical appliance ..... A. V. Todd  
 Swimming mitt ..... H. W. Johnson  
 Switching system, Electrical ..... G. Wright et al  
 Swivel, Hydraulic ..... H. G. Johnston  
 Syringe ..... E. H. Hiss  
 Syringe, Hypodermic ..... R. Walsh  
 Tablet feeding machine ..... J. W. & A. M. Ayers  
 Tack claw ..... W. G. Browne  
 Take up, Spring actuated ..... G. H. Forsyth  
 Tank ..... T. H. Butler  
 Tanning apparatus ..... C. J. Glaser  
 Tapping and boring machine, Upright ..... L. H. Colburn  
 Tapping apparatus, Keg ..... J. E. Easter et al  
 Telegraphic systems, Coherer for wireless ..... L. Dorman

Telephone receiver support ..... G. W. Ganoe  
 Telescope ..... G. M. Searle et al  
 Thermostat ..... A. Roesch  
 Thill coupling ..... S. P. Rodobaugh et al  
 Threshing machine ..... J. H. Gardner  
 Threshing machine grain separator ..... F. M. Carter  
 Ticket, Time limit ..... R. W. Wood  
 Tiling block, Hollow ..... K. M. Mitchell et al  
 Tire setting machine, Vehicle ..... H. R. Auld  
 Toilet and advertising device, Combined ..... A. A. Root  
 Toilet article ..... H. E. Harlan  
 Tool ..... J. Arrington  
 Tool, Combination ..... C. R. Jeffords  
 Tool, Compound ..... J. F. Watermolen  
 Tool handle ..... J. A. Harold  
 Tool handle fastener ..... J. F. McCullum  
 Tool, Machine ..... D. Roberts  
 Tooth, Artificial ..... D. N. Booth  
 Towel holder ..... J. Blum  
 Toy ..... G. A. Johnson  
 Toy ..... L. C. Spencer  
 Toy, Bag punching ..... F. L. Safer  
 Toy, Detonating ..... C. E. Wenzel  
 Traction wheel ..... J. W. Livermore  
 Train order holding device ..... C. J. Quay  
 Tramways, Discharge terminal for wire rope ..... B. C. Riblet  
 Tramways, Grip for aerial wire rope ..... B. C. Riblet  
 Transformer ..... G. Wright  
 Tree climbing motor ..... W. P. Kidoer  
 Tree protector ..... D. H. B. Hooper  
 Trolley contact device ..... W. L. Baker  
 Trolley finder ..... F. A. Graham et al  
 Trolley wheel casing ..... T. Kelch  
 Truss ..... R. Doane  
 Tube cleaner ..... T. J. Hart  
 Tubing, Apparatus for manufacturing seamless ..... J. H. King et al  
 Tunnel construction, 3 pats. ..... J. F. O'Rourke  
 Turbine governor, Electric ..... W. L. R. Emmet et al  
 Turbine regulator, Steam ..... P. J. Hedlund  
 Turbine, Steam ..... P. J. Hedlund  
 Turpentine pocket ..... A. G. Geiger  
 Type setting machine ..... G. E. Kenney  
 Type writer copy holder ..... I. H. P. Colleen  
 Type writer platen ..... G. W. Doubling  
 Umbrella ..... J. F. Flad  
 Valve, Balanced slide ..... B. W. Schenebeck  
 Valve, Cut off ..... J. W. Mellinger  
 Valve, Float ..... J. L. Valerius  
 Valve seat dressing device ..... W. Hagspiel  
 Vat, Self emptying ..... T. L. Valeus  
 Vehicle body ..... F. P. Conrad  
 Vehicle body raiser ..... J. Cryderman  
 Vehicle, Dumping ..... F. Hill  
 Vehicle, Motor ..... J. W. Grubbs  
 Vehicle propelling device ..... J. P. Laue  
 Vehicle wheel dust cap ..... E. S. Becraft  
 Velocipede harness ..... J. N. Patten  
 Vending apparatus, Coin controlled ..... C. W. Platt  
 Vending machine ..... H. J. Davis  
 Vending machine ..... F. M. Trauer  
 Ventilating device, House ..... F. B. Moore  
 Vise, Bench ..... J. A. Blake  
 Vise, Quick acting ..... C. A. Herriman  
 Voting machine, 5 pats. ..... A. F. Bardwell  
 Voting machine booth construction ..... A. F. Bardwell  
 Wagon ..... O. E. Casey  
 Wagon, Dump ..... N. L. Phillips  
 Wagon top ..... J. Pohlig  
 Wall plug ..... H. M. Mortu  
 Warm air furnace, 2 pats. ..... O. L. Badger  
 Washing machine ..... W. A. S. Murphy  
 Washing machine ..... J. S. Trimble  
 Water containing vessels, Alarm for ..... J. O'Connor et al  
 Water heater, Downdraft ..... W. J. Haddock  
 Water motor, Current ..... W. J. Trechard et al  
 Waterproof fabric ..... A. Muller-Jacobs  
 Well drilling, Water supply device for ..... H. Ladley  
 Welsbach or other burner ..... T. Wilson et al  
 Wheel ..... L. B. Seeds  
 Whist tray, Duplicate ..... 3 pats. G. M. Pierce  
 Whistle, Chime ..... I. Anderson  
 Window cleaner ..... W. H. Cattle  
 Wire core machine ..... T. A. Anton  
 Wire pay out reel ..... J. P. Delphay  
 Wire stretching device ..... H. W. Fisher  
 Wire structure ..... G. W. Murray  
 Wire twisting and weaving machine ..... C. Pfeiffer  
 Work box ..... R. G. McDowell  
 Woven fabric ..... N. H. Merriam  
 Wrench ..... W. E. Seanor

## DESIGNS.

Bedstead and frame ..... F. G. Woodruff  
 Braid ..... J. P. Swift  
 Electric motor cabinet stand ..... J. A. Reade, Jr et al  
 Handle for cups or other receptacles or vessels ..... S. G. Wilkes  
 Radiator ..... C. M. Woolley  
 Silverware mounting ..... A. C. Miller  
 Spoons, forks, or similar articles, Handle for ..... C. Crees et al  
 Stone Cut ..... A. M. & I. Tolowsky  
 Watchcase ..... 2 pats. O. M. Freeman

Issued November 3, 1903.

## MECHANICAL PATENTS.

Accumulator plate or grid ..... J. von der Poppenburg  
 1-Acetylarnido 2-4-diamidobenzene, O. Dressel  
 Acid ester and making same, Trimethyl-cyclohexenoncarboxylic ..... G. Merling et al  
 Acid, Making anthraquinone alpha disulfonic ..... F. E. Schmidt  
 Air and separating oxygen therefrom, Apparatus for liquefying ..... E. C. Thrupp  
 Amusement, Mechanical ..... O. B. Danner  
 Anesthetic administering apparatus ..... G. H. Hurd  
 Anesthetic apparatus ..... V. Knowles  
 Animal trap ..... G. E. Alphin  
 Apparel, Wearing ..... A. E. Tabor

Asphalt surfaces, Apparatus for heating ..... J. W. Nesmith  
 Assay furnace, Crucible ..... C. N. Anthony  
 Auger, Well ..... C. N. Hutchins  
 Automobile steering mechanism ..... L. Mott  
 Awning fixture ..... A. De Simone  
 Axle, Rotary ..... C. Faulkner  
 Back band hook ..... I. G. Carmack  
 Back band hook ..... J. W. Hazlewood  
 Band cutter and feeder ..... O. W. Brown  
 Barrier and door holder, Folding ..... C. P. & F. E. Howard  
 Basket ..... J. Jr. & W. Brown  
 Bath fluids, Means for introducing gases into ..... L. von Orth  
 Battery ..... 2 pats. J. W. Gladstone  
 Battery ..... G. Schaul et al  
 Battery charging system, Secondary ..... H. P. Maxim  
 Battery grid ..... G. H. Rabenalt  
 Bearing ..... W. D. Richter  
 Bearing, Antifriction ..... F. M. Carroll  
 Bed, Folding ..... C. P. Brown  
 Bed rail ..... W. D. Hall  
 Bells, Orchestra ..... C. H. Agre  
 Billiard cue tip ..... H. Seelinger  
 Binder, Temporary ..... E. A. Trussell  
 Blowpipe, Oxyhydrogen ..... W. H. Murphy  
 Boilers, Compound for the removal and prevention of incrustation in steam ..... W. B. Fitzpatrick  
 Boiler water purifier ..... I. V. Holmes  
 Bolster ..... C. F. Huntton  
 Bolt cutter ..... N. Lamb  
 Bolt holder, wrench, and bolt extractor, Combined ..... G. W. Seddlmeyer  
 Bomb, Despatch ..... H. B. Littlepage  
 Bookkeeping ..... E. E. Crandall  
 Boot tree ..... W. F. Packard  
 Boring or planing concave or cylindrical surfaces, Automatic tool for M. E. Knight et al  
 Bottle, Non refillable ..... R. Hearn  
 Bottle washing apparatus ..... O. Eick  
 Bouquet holder, Fountain ..... E. Buchan  
 Brake beam fulcrum block ..... R. P. Lamont  
 Brake operating apparatus, L. T. Canfield et al  
 Bread mixer and kneader reissue J. F. Stevens  
 Brick for heating purposes, Porous J. J. Lawler  
 Brick kiln ..... J. W. Aregood  
 Brick truck ..... A. A. Scott  
 Broom filing table, Rotary ..... L. J. Remmele  
 Broom or brush, Rotary ..... L. J. Remmele  
 Buckle, Harness ..... E. Davidson  
 Buckle opening device ..... G. F. Carey  
 Buffer pad holder ..... T. Robinson  
 Building block and wall ..... F. E. Kidder  
 Building structure ..... C. M. Ellinger et al  
 Bunsen burner ..... A. H. Humphrey  
 Burial casket ..... P. J. McGuire  
 Burner ..... A. J. Coghe  
 Buttonhole cutting and stitching machine ..... E. B. Allen  
 Cable grip ..... W. O. Gunkel  
 Camera plate holders, Light excluding attachment for ..... R. A. Bacon  
 Caudle molding apparatus ..... J. Burpitt  
 Canned goods processing apparatus ..... R. D. Bradley  
 Cap or closure, Screw ..... J. C. Potter  
 Car brake operating mechanism, Railway ..... J. H. Bruce  
 Car, Convertible ..... H. Romander  
 Car, Convertible passenger ..... A. Kimble  
 Car coupling ..... G. W. Wiley  
 Car, coupling ..... J. B. Strauss  
 Car coup ing ..... S. E. Jackman  
 Car, Dump ..... H. S. Hart  
 Car grain door, Railway ..... F. Hachmann  
 Car, Metallic ..... J. A. Driver  
 Car roof ..... S. Herbert  
 Car seat ..... H. Witte  
 Car ventilator, Exhaust ..... L. C. Lauphear  
 Carbureter, Explosion engine ..... F. H. Smith  
 Carbureting apparatus ..... W. Kahle  
 Carding engine puppet ..... W. H. Eddy  
 Carpets, floors, &c. Pneumatic device for cleaning ..... A. Lotz  
 Cart or wagon, Dumping ..... T. M. Murphy  
 Cartridge, Gun ..... W. C. Bush  
 Cash carrier ..... W. L. Churchill  
 Casting hollow metal bodies, Apparatus for ..... P. de Hemptinne  
 Ceiling or floor construction ..... H. Eggert  
 Cement, Manufacture of Portland ..... H. K. G. Bamber  
 Chain, Conveyor ..... M. Garland  
 Chain wreath ..... G. W. Bufford  
 Churn ..... W. L. Bashford  
 Cigar band ..... L. M. Weiller  
 Cigar machine ..... E. Kuhne  
 Cigar or pipe tray ..... J. B. Crapp  
 Cigar pressing apparatus ..... R. Woerner  
 Circuit controller, Alternating current ..... C. D. Ehret  
 Circuits, Potential regulator for alternating current ..... H. R. Stuart  
 Clasp ..... G. M. Hubbard  
 Clothes line apparatus ..... J. L. Knight et al  
 Clutch ..... E. C. Houn  
 Coat breast stay ..... M. M. Marks  
 Cock, Water gage ..... C. C. Wakefield  
 Coin controlled machine coin controlled feeding apparatus ..... E. S. Schuele  
 Computing machine ..... J. W. Todd  
 Concentrator ..... J. J. Montgomery  
 Confectionery, Manufacture of sweetmeats or similar articles of ..... E. W. Barratt  
 Converter coupling, Universal ..... T. H. Tracy  
 Conveying and loading machine ..... J. A. Low  
 Cooking utensil ..... C. D. Argur  
 Cooking utensil ..... A. G. Boone  
 Cord knotter, Wrapping ..... F. Terwilliger  
 Core and tire, Resilient ..... C. Miller  
 Core making apparatus ..... W. Weaver  
 Corking machine ..... J. Coomber  
 Corn shucker ..... 2 pats. N. Ostiguy  
 Corset ..... J. M. Van Orden  
 Cowl ..... W. J. Kayser  
 Crate, Egg ..... A. T. Bodle  
 Cream separator operating mechanism ..... J. F. Persoons  
 Crushing and pulverizing mill ..... E. C. Griffin  
 Cu tivator, Disk ..... N. S. Barker  
 Cuspidor, Pocket ..... W. C. Mitchell  
 Cut out and controlling switch, Combined ..... I. S. Chadwick  
 Cutter head ..... F. S. Stutzman  
 Cutter head ..... J. Bresman  
 Cutting apparatus ..... J. Stevens  
 Cylinder, Metal ..... E. E. Arnold  
 Derrick ..... W. S. Jacobs

Digging machine, Trench ..... J. H. W. Libbe  
 Dish mop, Self soaping ..... B. B. Babbitt  
 Disinfecting apparatus ..... F. M. Wise  
 Disinfecting apparatus ..... P. Simundt  
 Disinfecting device, Telephone ..... N. J. Tubbs  
 Display and vending case ..... W. Meyer  
 Display apparatus ..... F. Woodbridge  
 Display apparatus, Color changing ..... F. Woodbridge  
 Display cabinet ..... J. U. Lasso  
 Display rack ..... T. P. Long  
 Display stand ..... J. S. Sufferin  
 Display system, Electrical ..... F. L. O'Bryan  
 Displaying and stretching device, Glove ..... M. V. Hammack  
 Door hanger ..... E. Brent  
 Door hanger ..... H. C. Smith  
 Door lock, Double ..... J. E. Keverline  
 Dough mixing and kneading apparatus ..... J. Koelner  
 Drying rack curtain or canopy ..... A. A. Scott  
 Drying room ..... K. Rey scher  
 Dust guard ..... W. M. Ryan  
 Dust guard ..... J. M. Mally  
 Dust pan ..... P. H. Gross et al  
 Dye and making same, Mouoazo ..... R. Gley et al  
 Dynamo ..... J. D. Spence  
 Dynamo machine ..... D. C. Jackson  
 Egg beater ..... G. E. Collins  
 Electric arc breaking apparatus, H. Hastings  
 Electric battery, 3 pats. ..... H. Halsey  
 Electric circuit cut out ..... E. M. North  
 Electric furnace ..... W. S. Franklin  
 Electric motor ..... E. B. Wilford et al  
 Electric motor controller ..... W. N. Vance  
 Electric switch ..... J. T. Robb  
 Electric switch ..... G. B. Thomas  
 Electric switch, Ratchet operated ..... W. Kingsland  
 Electrical conductors, Means for removing steel, &c. from ..... E. E. Ries  
 Electrical connector ..... J. G. Swain  
 Electrical distribution system ..... J. H. Hallberg  
 Electrode, Arc lamp ..... H. Bremer  
 Electrolytic apparatus ..... E. Hannon  
 Electrolytic process, 2 pats. ..... E. Hannon  
 Elevator attachment ..... W. H. Dolbey  
 Engine ignition device, Explosive ..... W. Remington  
 Engine sparking coil, Gas ..... E. J. Stoddard  
 Engraving machine ..... P. V. Avril et al  
 Envelop, &c ..... W. Myers  
 Envelop, Safety ..... J. F. Naugle  
 Evaporating apparatus ..... G. D. Harris  
 Evaporating liquor ..... E. N. Trump  
 Exercising apparatus ..... A. E. Terry  
 Explosive engine ..... M. H. Roberts  
 Eyeglass nose piece ..... W. F. Kornemann  
 Eyeglasses or spectacles, Mounting for rimless ..... H. A. Grossman  
 Fabric cutting and folding machinery ..... E. H. Cottrell  
 Feed water, Purifying boiler ..... I. V. Holmes  
 Feeding poultry or other creatures, Apparatus for automatically ..... E. Clapp  
 Fence post ..... H. J. Cooper  
 Fence rail ..... R. C. Jr. & W. A. Stewart  
 Ferrules or rings of metal, Machine for expanding ..... H. B. Sherman  
 Filing cabinet ..... M. M. Brown  
 Filing cabinet ..... H. C. Yeiser  
 Filter ..... A. E. Cummer  
 Firearm recoil minimizer ..... W. S. Simpson  
 Fire resisting window ..... G. Hayes  
 Fireproof building structure ..... W. Klink  
 Fireproof construction ..... H. L. Kubernuss  
 Fireproof girder or beam ..... W. N. Wight  
 Fireproof metal window ..... J. A. Knisely et al  
 Fine cutter ..... J. M. Sherman  
 Flushing apparatus ..... H. F. Neumeyer  
 Form, Display ..... C. A. Ufford  
 Freezing box ..... A. E. Wilson  
 Fumigating means ..... L. W. Cock  
 Furnace flues and tubes, Manufacturing corrugated ..... W. Rainforth  
 Furnace peep hole attachment, Blast ..... A. L. Smith  
 Furnaces, Apparatus for the manufacture of corrugated ..... W. Rainforth  
 Game ..... T. Sonne, Jr  
 Game apparatus ..... G. H. Stults  
 Garment Combination ..... R. E. Reznick  
 Gas burner, Incandescent ..... R. C. H. Siewerts  
 Gas burner, Safety ..... A. A. Lovejoy  
 Gas engine ..... E. E. Arnold et al  
 Gas engine ..... E. N. Dickerson  
 Gas generator, Acetylene ..... P. E. Ward et al  
 Gas heater ..... J. G. Burns  
 Gas light controller ..... P. Rademacher  
 Gas meter prepayment attachment ..... R. L. Fresenheim  
 Gas pressure increasing and regulating apparatus ..... F. A. Ray  
 Gas shut off Automatic ..... C. J. McCormick  
 Gate or end post and anchor therefor ..... A. H. & C. R. Cook et al  
 Gearing ..... M. E. & C. H. Bacon  
 Gearing for grinding or other mills ..... J. C. Dell  
 Gearing, Reducing and backing ..... G. F. Evans  
 Glass, Apparatus for the manufacture of sheet ..... W. A. Page et al  
 Glass, Manufacture of sheet, W. A. Page et al  
 Glass molding machine ..... F. H. Gibson  
 Glass or glassware, Coloring ..... F. Scherhag  
 Golf ball ..... J. H. Roger  
 Governor, Automatic ..... A. R. Dodge  
 Governor, Automatic ..... O. Junggren  
 Grain drill attachment ..... P. H. Murphy  
 Grain meter ..... J. S. Blakely  
 Grinding machine, Drill ..... C. Ridderhof  
 Grinding stone clamp ..... W. L. Messer  
 Grinding stone or wheel clamp ..... W. L. Messer  
 Grocer's bin ..... A. H. Miller et al  
 Guitar attachment ..... E. O. Bergren  
 Gun carriage, Separable ..... A. T. Dawson et al  
 Guns, Elevating, traversing, and sighting apparatus for field ..... A. T. Dawson et al  
 Harness making or mending device ..... S. Izant  
 Harrow, Disk ..... H. S. Howard  
 Harrow, Rotary ..... F. Hanson  
 Harvester ..... E. A. Calling  
 Harvesting implement ..... J. W. Feathers et al  
 Harvesting knife, Tobacco ..... J. B. Gatewood  
 Hats, Crown die for forming ..... H. O. Stearns  
 Hay and stock rack, Combined ..... B. Tanner  
 Headlight blind, Locomotive ..... A. Mentzer  
 Heel attaching machine ..... E. Woodward  
 Hinge ..... A. C. Haycock  
 Hoisting apparatus ..... A. Jackson  
 Hoop or band for cylindrical casings ..... I. B. Hammond



Boe support ..... J. C. Garrett  
 Bolt to couplings. Means for attaching ..... H. B. Sherman  
 Bolts from shrinking. Device for preventing ..... L. E. Koch  
 Hoseless. Seamless. G. Wood, Jr.  
 Hydrocarbon burner ..... H. E. Brunner et al  
 Impulse wheel ..... L. W. Noyes  
 Insulating mechanism ..... W. T. Treadway  
 Inhaler ..... J. N. McKim  
 Inkstand ..... J. C. B. Taber  
 Insulating material ..... G. T. Pratt  
 Insulating material. Manufacture of electrical ..... C. Jung et al  
 Jewelry setting ..... C. T. Wiustein  
 Kerosene engine ..... G. A. Phail  
 Kite ..... F. Lischiak  
 Knitting machine ..... W. C. Whitcomb  
 Knitting machine needle ..... A. Currier  
 Knitting machines. Mechanical movement for ..... R. W. Scott et al  
 Labeling round pasteboard or paper boxes or ..... F. E. Jagenberg  
 Lace fastener ..... L. H. Hyer  
 Lace fastener. Shoe ..... W. H. Koltz  
 Lacing for garments ..... C. E. Fobburgh  
 Ladder. Life saving ..... F. Scherier  
 Lamp circuits. Ballast device for electric ..... H. N. Potter  
 Lamp. Electric arc. 5 pats ..... H. Bremer  
 Lamp glowers. Terminal for electric ..... H. N. Potter  
 Lamp holder ..... J. T. Golcher  
 Lamp. Inverted incandescent ..... T. B. & T. E. Smith  
 Lamp. Night. Reissue ..... H. Modler  
 Lamp socket. Incandescent electric ..... A. Weber, Sr.  
 Lamp socket. Incandescent electric ..... A. Weber, Jr.  
 Lamps. Operating electric ..... H. N. Potter  
 Lamps. Steadying resistance for electric ..... H. N. Potter  
 Last ..... J. F. Plummer  
 Latch ..... O. C. Little  
 Lawns, &c. Machine for tending ..... M. E. Blackwood  
 Leather cutting knife ..... J. W. Wueman et al  
 Leather. Producing grain ..... M. Panko  
 Leg. Artificial ..... C. A. Frees  
 Level and quadrant. Carpenter's ..... W. Potter  
 Lifting jack ..... F. Durgin  
 Linotype machines ..... J. G. Holbourn et al  
 Liquid discharging device ..... W. C. Morrill  
 Liquid heater. Electric ..... F. Briggs  
 Lock ..... H. B. Walbridge  
 Lock and latch. Combined ..... J. E. Keenline  
 Log turner ..... C. E. Cleveland  
 Loom. Multiple harness ..... D. Robinson  
 Loom. Needle ..... E. H. Ryan  
 Loom shuttle motion ..... W. H. White  
 Loom web controlling mechanism ..... F. E. Kip  
 Loom web detecting mechanism ..... G. F. Hutchins  
 Lubricator or lubrication system ..... P. J. Lockwood  
 Mail box ..... M. S. Ede  
 Mail box ..... G. E. Roesch  
 Mail box ..... M. J. Lawrence  
 Mail carrier. Rural ..... C. C. Lester  
 Massage instrument ..... H. A. Church  
 Mat ..... P. J. Shrum  
 Mat ..... J. E. MacMurray  
 Mattress section. Adjustable ..... F. G. Souder et al  
 Mechanical movement ..... F. M. Dillon et al  
 Medical apparatus. Magnetic ..... E. Bachelet  
 Metal shearing device ..... W. Wiek  
 Metallurgical process ..... O. W. Brown et al  
 Military or naval problems. Apparatus for the demonstration and study of ..... B. B. Hill  
 Mine or submarine boat destroyer ..... A. F. Humphrey  
 Mine signal system ..... N. K. Bowman  
 Mineral or other dry substances. Apparatus for mixing ..... C. W. Speers  
 Molding machine ..... B. C. White  
 Motion transmitting device ..... G. F. Evans  
 Motor ..... J. G. Carlinet  
 Motor controller and engineer's valve. Combined ..... F. W. Caldwell  
 Musical apparatus. Mechanism for accentuating one or more notes in mechanically actuated ..... J. H. Dickinson  
 Musical apparatus. Mechanism for accentuating one or more notes in mechanically actuated ..... F. Young  
 Musical instrument ..... J. O'Connor  
 Musical instruments. Means for adjusting music rolls in ..... E. S. Votey  
 Nail puller ..... E. H. Norris  
 Nebulizer ..... G. W. Hopkins  
 Neck and chest protector ..... S. A. Alouton  
 Needle or threader. Tape M. A. & W. Doring  
 Numbering machine ..... T. H. Boss  
 Nut lock ..... F. Robinson  
 Nut wrench. Double acting ..... H. D. Pelle  
 Oil burner ..... H. L. Sherwood  
 Oil burner ..... J. Frosham  
 Oil burner. Combined automatic spindle ..... F. A. Curtis  
 Order indicator ..... N. P. Agnew  
 Ordnance ..... H. S. Reynolds  
 Ore crushing mill ..... A. B. Mouck  
 Ore size settling and classifying apparatus ..... F. W. Snelman  
 Ores, &c. Classifier for crushed ..... R. W. Watson  
 Overshoe fastening device ..... J. M. March  
 Package. Sanitary delivery and display ..... W. B. Page  
 Packing. Metallic ..... W. R. Edwards et al  
 Packing ring ..... T. F. Meehan  
 Pan ..... F. B. Tupper et al  
 Paper bag machine ..... A. J. Wikander  
 Paper clamping device ..... F. T. Becker  
 Paper cutting machines. Clamping apparatus for ..... B. F. De Costa  
 Paper making machine calendar rolls. Feed mechanism for ..... R. Smith  
 Paper sheet ..... W. N. Caldwell  
 Paper tube machine winding arbor ..... C. A. Bailey  
 Pavements. Heating asphalt ..... J. W. Nesmith  
 Paving composition. Producing asphaltic ..... J. H. Amies  
 Pencil holder ..... W. J. Seebold et al  
 Petrol motor ..... A. Clement  
 Piano music desk ..... R. S. Bowen

Pipe attachment. Soil ..... J. A. Godin  
 Pipe corrugator. Sheet metal ..... M. L. Hunker  
 Pipe finishing machine ..... C. O. Strutz  
 Pipe wrench ..... D. Nesin  
 Pistol. Rapid fire ..... W. B. Knoble  
 Planter ..... S. S. Pharr  
 Planter. Potato ..... F. E. Shaw  
 Plow ..... A. A. Pearce et al  
 Plow attachment ..... J. Storey  
 Plow. Disk or rotary ..... N. Sanders  
 Plow root cutting attachment ..... W. Luquire  
 Plug elevator ..... S. H. McCarrill  
 Pneumatic despatch tube system ..... M. Stange  
 Pneumatic engine ..... W. E. Peters  
 Pneumatic tube carrier ..... M. Anderson  
 Press board polishing machine ..... S. E. Dart  
 Printer's case ..... H. P. Hamilton  
 Printer's quoin ..... G. B. Huntington  
 Printing apparatus ..... R. Herman  
 Printing machine. Fabric ..... J. G. Sanderson  
 Printing mechanism shifting device ..... G. W. Donning  
 Printing presses. Automatic delivery device for platens of ..... J. R. Fox  
 Pump ..... C. C. Worthington  
 Pump ..... F. C. Lewis  
 Pump ..... B. C. White  
 Pump. Centrifugal high pressure ..... P. Kugel et al  
 Pump. Gas ..... R. Whitaker  
 Pump mechanism ..... E. C. Brown  
 Punch and lacingawl ..... J. J. Rogers  
 Puzzle ..... E. S. Mowry  
 Quartz mill ..... J. Y. Byers  
 Quicksilver ore reducing apparatus ..... F. C. Meyer  
 Rail joint ..... W. Ross, Sr.  
 Rail joint ..... J. Kaufman  
 Rail tie ..... W. Gasser  
 Railway ..... 2 pats ..... S. E. Jackson  
 Railway alarm. Automatic ..... H. F. Barlett  
 Railway bond ..... H. E. Prochier  
 Railway danger signal. Automatic ..... S. M. Davis  
 Railway folders. Foldable holder for ..... L. Blair  
 Railway safety gate. Automatic ..... H. E. Bartlett  
 Railway screw spike ..... L. Renn  
 Railway signal and alarm ..... A. E. Caughley  
 Railway splice bar ..... W. L. Bauer  
 Railway switch opening or closing apparatus ..... J. S. Jones et al  
 Railway tie ..... A. C. Waterman  
 Rail way tie ..... J. H. Jenni gs  
 Rail way tie. Metallic ..... C. L. Kenn  
 Receptacle or drawer. Sliding ..... J. C. Gauthier  
 Record card. Complete school ..... F. D. Boynton  
 Record keeper. Family ..... R. A. Flanagan  
 Refrigerator ..... B. Parish  
 Rein fastener and button ..... J. G. Smith  
 Reversing mechanism ..... F. J. Ball  
 Reversing mechanism ..... J. A. Bjur  
 Rice polishing machine ..... R. W. Weich  
 Road bed. Automobile ..... R. T. Van Valkenburg  
 Rod coupling ..... J. G. Alexander  
 Roller attachment. Steam ..... W. Salway  
 Root knife and subsoiler. Combined ..... A. M. Jacobs  
 Rotary engine ..... A. H. Pierce  
 Rotary engine ..... D. Mottell  
 Rotary engine ..... J. P. M. Halybarton  
 Rotary engine ..... G. W. Montgomery  
 Rotary engine ..... K. L. Barnhart  
 Rotary explosive engine ..... G. C. Blasdel  
 Rowlock for boats ..... A. Fenwick  
 Ruiner and blotter. Combined ..... J. H. Watson, Jr.  
 Sanitary trap ..... J. W. McAniffe  
 Sash balance ..... W. Berry  
 Sash balance and lock ..... W. Berry  
 Sash lock, &c. Ventilating ..... J. C. Blair  
 Saw collar truing machine ..... R. O. Wigley  
 Sawing machine. Portable wood ..... E. E. Swarthout  
 Sawmill ..... E. Dyer  
 Scale. Weighing ..... M. F. Kox  
 Screen or storm window. H. S. & A. P. Hubbell  
 Screw jack ..... M. Ketterer  
 Separator ..... H. H. Humphrey  
 Separator screen shoe ..... J. N. Kaylor et al  
 Sewing machine. Shoe and leather ..... J. L. Kieffer  
 Sewing machine work guide ..... J. C. Harper  
 Shade fixture. Window ..... D. Hoyt  
 Sharpening device. Knife ..... T. Wilkins  
 Shearing and clipping device ..... J. K. Priest  
 Sheet delivery mechanism ..... K. Menie  
 Sheet metal box or can ..... B. Adriance et al  
 Sheet metal elbows. Making ..... W. C. Winfield  
 Shirt waist and skirt supporter ..... A. Witsey  
 Shoe top fastener ..... J. W. Reiley  
 Show case ..... J. M. Biggerstaff  
 Signal mechanism. Framework for supporting ..... R. Herman  
 Siphon filler ..... W. H. McKenna  
 Soap supplier ..... J. Schwecher  
 Sod cutter ..... J. M. Harlan  
 Sodium sulfite. Obtaining ..... H. H. Wing  
 Speed and reversing mechanism. Variable ..... F. O. Farwell  
 Speed indicator ..... H. P. Churchill  
 Speed limiting means. Safety ..... J. W. Neuricks  
 Speed varying machine ..... G. H. Cleveland  
 Spinning and doubling apparatus ..... T. Ashworth  
 Spinning frame ring and traveler ..... 2 pats ..... Z. Booth  
 Spittoon ..... F. K. Beyer et al  
 Spoon ..... F. A. Brownell  
 Spraying apparatus strainer attachment ..... A. I. Loop  
 Spring clip ..... 3 pats ..... G. W. McGill  
 Staff and lever lock ..... T. H. Patenall  
 Stamp affixing device ..... J. J. Fargue et al  
 Stamp. Time ..... J. C. Wilson  
 Stamping nuts or other similar articles. Machine for ..... T. H. Ford et al  
 Stave sizing and crozing machine ..... D. C. Putnam  
 Stay. Metallic ..... G. S. Herrick et al  
 Steam boiler ..... W. C. Temple  
 Steam boiler ..... D. M. Webster  
 Steam boiler ..... L. L. Griffiths  
 Steam engine ..... J. Misong  
 Steam engine ..... C. C. Worthington  
 Steam engine ..... L. Hicks  
 Steam generating apparatus ..... I. V. Holmes  
 Steam generator. Tubular ..... J. McKehe  
 Steering device ..... C. Ewing  
 Stoker. Mechanical ..... W. T. Binner  
 Stoker. Mechanical ..... E. F. Edgar  
 Stone. Manufacture of artificial ..... C. W. Stevens  
 Storage bin ..... J. A. Jamieson

Stove. Gas ..... F. J. Doyle  
 Stove. Heating ..... J. L. F. Bau r, Jr.  
 Stove. Heating ..... T. Young  
 Stovepipe joint ..... C. A. Overton  
 Street sweeper brush ..... J. T. Collins  
 Structural member. Composite ..... J. Kahn  
 Superheaters. Protective means for ..... F. D. Potter et al  
 Swing. Lawn or house ..... J. S. Tuttle  
 Switch ..... M. E. Hepburn  
 Switch stand. Automatic ..... F. C. Anderson  
 Table and desk. Combination ..... P. Douglas  
 Tack puller ..... W. C. Miller  
 Telegraph receiver. Printing ..... J. D. White  
 Telegraphic transmitter ..... A. E. Morelock  
 Telegraphy. Wireless ..... F. Braun  
 Telephone tie wire ..... G. F. Moore, Jr.  
 Temp. et for ships' carpenters. Adjustable ..... T. B. Way  
 Therapeutic apparatus. Electromagnetic ..... E. Bachelet  
 Therapeutic appliance ..... G. M. D. Merwin  
 Thimble ..... C. Hemenway  
 Tire. Pneumatic ..... J. R. Brunet et al  
 Tire removing device. Vehicle ..... H. Atwater  
 Tire. Vehicle ..... G. W. Southwick  
 Tongue support. Wagon ..... W. L. Park  
 Tool. Combination ..... W. G. Harris  
 Tool. Fluid pressure operated ..... H. H. Vaughan et al  
 Tool. Fluid pressure operated ..... C. H. Johnson  
 Top. Bounding ..... W. Griffin  
 Torpedo. Druggable ..... D. W. McLaughlin  
 Transplanter ..... L. W. Snowden  
 Tread, &c. Stair ..... F. W. Huestis  
 Tree. Artificial ..... A. Hummel  
 Tripod ..... L. C. Otto  
 Trolley alarm. Safety ..... W. M. Gruner et al  
 Trolley mechanism ..... C. I. Earll  
 Trolley pole. Automatic self dropping ..... J. Delane  
 Truss. Hernial ..... S. H. Phillis  
 Tube expander ..... C. F. Carly  
 Turbine ..... A. W. & Z. W. Daw  
 Turbine governing mechanism ..... J. Wilkinson  
 Turning machine. Wood ..... W. G. Cooper et al  
 Type writer. Telegraphic transmitting attachment ..... A. E. Morelock  
 Type writing machine carriage ..... A. K. Williams, Jr.  
 Vacuum pan ..... E. N. Trump  
 Valve and system. Alarm ..... E. L. Thompson  
 Valve device ..... C. H. Watters  
 Valve. Engineer's ..... W. H. Nightingale  
 Valve. Foot ..... J. C. Loucks  
 Valve for barrels, &c. Double acting combination lock ..... W. H. Baker  
 Valve spring ..... F. L. Smith  
 Vehicle steering gear ..... A. L. Wank  
 Vehicle wheel. Spring ..... J. Jackson  
 Vending machine. Coin controlled ..... F. J. Kowse  
 Vessel ..... W. G. Jamieson  
 Vessel loading apparatus ..... C. J. Ingard  
 Vessel or container ..... W. S. Mellen  
 Vise. Pipe ..... W. J. Grunden  
 Wagon jack ..... S. Shieffler  
 Waist brace and belt holder. Combined ..... C. Bremer  
 Washboard ..... B. Tanner  
 Washing machine ..... T. E. Blanchard  
 Water closet ..... P. K. Hardin  
 Water elevator ..... E. P. House  
 Water gate guard and mirror ..... R. S. Mears  
 Water hoisting apparatus ..... W. Hubartt  
 Water level regulator ..... R. L. Short  
 Water meter ..... C. C. Worthington  
 Water motor ..... L. E. Bqvist  
 Waterproof garment ..... J. Kipp  
 Water purifying apparatus ..... J. Anderson  
 Water tight power doors or hatches. Apparatus for operating ..... W. B. Cowes  
 Water tube boiler ..... W. J. Dugan  
 Water tube boiler ..... W. C. Temple  
 Wells. Means for operating ..... P. C. Connors  
 Wheel ..... J. M. Crosby  
 Wheel ..... C. L. Votaw  
 Wheel ..... W. B. Roberts  
 Wheel and wheel rim ..... F. J. Humps  
 Windmill pump rods. Swinging guid for ..... G. Schneider  
 Windmill tower ..... S. B. Martin  
 Window fastener ..... O. C. Little  
 Window fastener. Adjustable burglar proof ..... N. S. Hillyard  
 Window frame. Metal ..... W. J. Kiem  
 Window screen ..... J. Pastalle  
 Window. Sliding and swinging sash ..... G. Hayes  
 Wire drawing machine ..... J. A. Horton  
 Wire netting machine ..... H. S. Combs  
 Wire stretcher ..... W. S. Reed  
 Wire winding machine ..... J. G. Bauer  
 Wires, cords, &c. Machine for covering ..... J. H. Scott  
 Wrench ..... F. A. Biehn  
 Wrench ..... J. Weisk  
 Wrench ..... M. Wenger  
 Writing machines, &c. Ribbon reversing mechanism for ..... C. F. Hopkins

## DESIGNS.

Brooch bar ..... E. H. Clarkson  
 Button. Emblematic ..... 2 pats ..... J. L. Thornton  
 Hammock body ..... I. E. Palmer  
 Hammock fabric ..... 2 pats ..... I. E. Palmer  
 Ornament ..... K. M. Chapman  
 Spoon ..... C. R. Boas  
 Stove plates, &c. Rim for ..... J. Magee

Issued November 10, 1903.

## MECHANICAL PATENTS.

Acid and making same. Methylene hippuric ..... A. Nicolai et al  
 Acid. Anthraquinone alpha sulfonic ..... K. E. Schmidt  
 Acids. Apparatus for making mixtures of nitric and sulfuric ..... F. I. du Pont  
 Alloy ..... W. Kubel  
 Amalgamator ..... H. Hoeschen et al  
 Animal trap ..... A. Arnesen  
 Anklet ..... E. M. Doug  
 Air brake attachment ..... H. F. Ong  
 Air brake hose coupling ..... A. F. Allan et al  
 Arithmograph ..... H. Ellis  
 Armature coil ..... C. Knappe  
 Atomizer ..... 2 pats ..... A. S. Dixon  
 Auger. Post hole ..... H. S. Butler

Awning ..... C. L. Gaylord  
 Awning frame. Combined roller and swinging ..... F. D. Frazee  
 Axle ..... C. P. Clark  
 Axle box ..... J. Kohn  
 Baby jumper ..... W. M. Nix  
 Badge pins, &c. Automatic catch for ..... C. J. Dieges  
 Bag holder ..... J. W. Fiddes  
 Bags, &c. Holder for ..... F. Cords  
 Bale tying attachment for compressors ..... J. H. Kennedy  
 Baling press bed plate ..... F. J. Coad et al  
 Bank. Savings ..... E. F. Brown  
 Barrel head dowsing machine ..... C. W. Boykin  
 Basin. Wash ..... W. G. Hoshock  
 Bath apparatus. Needle and shower ..... D. W. Dinneen  
 Bath tub bracket attachment ..... J. E. Palmatary  
 Bearing for wagon reaches. Antifriction ..... G. W. Gardner  
 Bedstead corner clamp ..... F. A. Weir  
 Beet root cutter ..... C. C. Brabant  
 Belt ..... F. F. Kothke  
 Bench stop ..... R. W. Balz  
 Berth. Folding ..... J. P. Lein  
 Block signal. Electric ..... W. S. Jackson  
 Block signal system ..... I. H. Francisco  
 Block system signaling device ..... M. J. Gallagher  
 Boat device. Recreation submarine ..... F. W. Brady  
 Boilers. Baffle for water tube ..... E. J. Miyabara  
 Bolster ..... A. Christianson  
 Boring machine sieve cleaner ..... W. Griscom et al  
 Book ..... J. B. Lyons  
 Bottle holder ..... R. L. McMullan  
 Bottle. Milk ..... S. L. Egen  
 Bottle. Non-refillable ..... C. H. Miller  
 Bottle. Non-refillable ..... W. B. Cockrell  
 Bottlestopping device ..... W. R. Green  
 Bottle washing machine ..... W. E. Brown  
 Box ending machine ..... C. W. Hobbs  
 Box or case ..... J. Nevelson  
 Brake beam ..... J. M. Hansen  
 Brake shoe key bolt. 2 pats ..... E. L. Adrien, Jr.  
 Bridge or culvert ..... E. P. Spaulding  
 Bridge. Transfer ..... A. H. Malvery  
 Broom trimmer ..... L. Pelton  
 Brooms. Device for the protection, preservation, and convenience in the keeping of ..... C. W. McKellar  
 Brush. Tooth ..... W. S. Stein  
 Butter packing machine ..... P. F. Gibbons  
 Button cutting machine ..... M. H. Hess  
 Cable holder. Manhole ..... H. C. Baker, Jr.  
 Cam ..... M. G. Man  
 Camera magazine plate changing apparatus. Photographic ..... A. A. Brooks  
 Camera. Photographic film ..... J. A. Robertson  
 Can floating machine. Round ..... W. Rubin  
 Can opener ..... H. B. Landis  
 Can or box structure ..... A. I. Little  
 Cane or corn topper ..... E. Jones et al  
 Car brake. Street railway ..... J. Wetz er et al  
 Car chair and berth. Sleeping ..... H. F. Hol et al  
 Car coupling ..... J. W. Smith  
 Car drait attachment. Railway ..... P. W. Agnell  
 Car. Dumping ..... E. S. Hart  
 Car fender. Street ..... M. Duffner  
 Car. Flat ..... J. M. Hansen  
 Car. Gondola ..... J. M. Hansen  
 Car haul ..... 2 pats ..... A. M. Acklin  
 Car heater ..... W. A. Joseph  
 Car heater. Electric ..... J. F. McElroy  
 Car lubricating device. Railway ..... J. Schanamen et al  
 Car. Ore ..... J. M. Hansen  
 Car sign. Shiftable ..... E. H. Barney  
 Car stake and making same. Railway ..... J. M. Hansen  
 Car window ..... C. E. Gale  
 Car with drop doors. Gondola ..... J. M. Hansen  
 Car with metallic underframing ..... J. M. Hansen  
 Carburetor. Explosive engine ..... J. D. Anderson  
 Carburetor feed ..... J. A. Bower  
 Carpet stretcher ..... F. L. Foss  
 Carpet sweeper ..... T. I. Duffy  
 Carriage curtain fastener ..... J. H. Marsh  
 Carriage seat shifting rail ..... J. Cummings  
 Casing puller ..... S. W. Munn  
 Caster ..... M. W. Owens  
 Catamenial appliance ..... H. A. & A. L. Iche  
 Centrifugal separator ..... H. C. Beckman  
 Chemical compound ..... W. J. Knox  
 Cherry seeding apparatus ..... J. Goodspeed  
 Chromium from chrome-iron ore. Extracting ..... R. Suchy et al  
 Churn dasher ..... E. A. Franklin  
 Cigar case ..... W. W. Pugh  
 Cigar moistener ..... E. F. Brown  
 Cigarettes from continuous filler rod. Machine for making ..... F. J. Ludington  
 Clamp ..... J. Kirschbaum  
 Clasp ..... C. H. Cohn  
 Cloth drying machines. Presser wheel for the chains of ..... J. J. Schofield  
 Clothes drier ..... G. F. Schrader  
 Clutch. Magnetic ..... C. Jenatzy. Fils  
 Coal storing and delivering apparatus ..... C. H. boardman  
 Coat stay ..... C. Richman  
 Cock. Bath ..... H. M. Weaver  
 Cock. Four-way ..... P. McDonald  
 Cock. Gage ..... A. J. Funk, Jr.  
 Coffee mill ..... A. E. Bronson, Jr.  
 Coin controlled machine ..... W. W. Rosenfield  
 Collar and hame fastener. Horse ..... J. Dolley  
 Collar fastening ..... J. W. Alexander  
 Collar. Horse ..... A. G. Couch  
 Columns or posts. Construction of ..... L. J. Sike  
 Compasses. Ellipse or circle ..... J. W. Griffith  
 Compensating system 2 pats ..... E. E. F. Creighton  
 Compress. Cold ..... H. Enax  
 Conveyor ..... G. A. Bronder  
 Corn husker ..... H. C. Chapman  
 Corn husker feeder ..... J. C. Shekey et al  
 Corn husking machine ..... H. T. Minick  
 Corn. Machine for removing the silk from green ..... J. C. McIntyre  
 Corn shocker ..... T. L. Creath  
 Corn pipe turning machine ..... C. O. Strutz  
 Cotton chopper and cultivator. Combined ..... J. W. Farmer  
 Cotton waste. Apparatus for treating ..... R. R. Boyd  
 Cotton waste. Treating ..... R. R. Boyd  
 Counting machine ..... J. B. Sleeman  
 Coupling ..... R. B. Hinton



Coupling release rigging. 2 pats. G. P. Ritter  
Cows' tails while milking. Device for securing... J. Badgerow  
Crate. Folding. C. A. Beittenmiller  
Crib, sofa, and lounge. Combined. T. Hanley  
Cross head and pitman connection. E. Farmer  
Cuff holder. E. A. Clark  
Cultivating implement attachment. H. Downer  
Cultivator. J. H. Martin  
Cuprous magnetic oxid. Making. W. J. Knox  
Current indicator. Reverse. L. Andrews  
Curtain fixture. F. D. Gimenez  
Curtain fixture. J. Trierweiler  
Cuspidor. C. E. Carter  
Cycle. Motor. H. B. Ruggles  
Dental bridge work riveting device. F. A. Jr., & F. A. Brewer, Sr.  
Dental engine chip blower and syringe attachment. L. Lyman  
Die stock. W. Haythorn  
Dish pan. V. A. Cassell  
Distributor or salt and pepper shaker. J. S. Duffie  
Ditching machine. A. J. Williams et al  
Door. Air. F. Schwitalla et al  
Door securer. C. R. Fleischmann  
Draft coupling. L. Kreitinger  
Draft enhancing apparatus. S. C. Davidson  
Draft equalizer. C. J. Jones  
Dredger. R. A. Perry  
Dredging purposes. Hydraulic elevator for. B. Flood  
Dry closet. Portable. J. Danner  
Drill attachment. L. A. Hardison  
Driving mechanism. Reversibly changed speed. R. M. Head  
Dye and making same. Yellow. J. Turner  
Dynamometer for electric current. M. E. Turner  
Egg separator. W. D. Evert  
Electric battery. E. Tweedy  
Electric circuit resistance. G. Wright  
Electric circuits. Apparatus for regulating the flow of current in. I. Kitsee  
Electric circuits. Means for regulating self-inductance in. C. F. Burgess et al  
Electric communicating system. 2 pats. J. T. Armstrong et al  
Electric cut out. L. W. Miller  
Electric fixture. K. Shaffer  
Electric lighter. C. Hubert  
Electric motor controller. H. H. Cutler  
Electric motors. Means for controlling the speed of. A. P. Warner  
Electric safety appliance. L. Kleitschi  
Electric separation means. E. Gates  
Electric switch. C. F. Ziegler  
Electric terminal. H. Brooks  
Electrical coils. Winding. R. Varley  
Electrical communications. Apparatus for transmitting. C. M. Jacobs et al  
Electrode and conductor. C. E. Acker  
Electrothermal diffuser. F. de Mare  
Elevator. W. Hamilton  
Elevator alarm signal. E. L. & G. Hall  
Elevator door automatically operating device. C. W. Kirsch  
Elevator operating system. Electric. W. Baxter, Jr.  
Elevator safety device. F. D. Potter  
End gate fastening. Vehicle. W. K. Clarke  
Engine. W. T. Fox  
Engine indicator. Steam. L. T. Snow  
Engine lubricating device. J. P. Kleber  
Engine mixer. Gas. H. F. Wallmann  
Engine starting device. Gas. D. F. Graham et al  
Engines. Governor block and oil receptacle for explosive. B. V. de Sutter  
Expectoration pouch. E. L. Calahan  
Eyeglasses. W. L. Bemis  
Eyeglasses. W. H. Weaser  
Eyelet. A. F. Mitchell  
Eyelet safety tie. J. K. Thoma  
Fan attachment. W. C. Norman  
Fans. Means for supporting or carrying the inclosing casings of centrifugal. S. C. Davidson  
Feed. Automatic water and fuel. J. N. Rice  
Feed box. R. W. Stimson et al  
Feed water heater. R. B. Benham  
Fence machine. Wire. A. C. Mills  
Fence machine. Wire. B. Baumgartner  
Fence post. A. M. Smith  
File case. W. C. Benbow  
Filling machine. G. Manierre  
Filter. Rotary. G. Moore  
Fire alarm. Electric. J. W. H. Uytendogaart  
Fire tube boiler. F. Burger et al  
Firearm. Revolving. J. H. Wesson  
Fish cutting machine. W. Mann  
Fishing reel. E. M. Funk  
Flanging machine. T. R. Johnson  
Fluid operated chair. A. N. Hornung, Jr.  
Fluid pressure coupling. M. G. Quackenbush  
Fluids. Traveling receiver for motor. J. L. Pilling  
Flush tank for closets. Automatic operating. M. Connor  
Foldable seat. J. Sharkey  
Fruit picker. F. Rohr  
Fruit picker. J. B. Lawrence  
Fuel. H. B. Bayles  
Furnace. D. R. Steele  
Furnace fires. Apparatus for enhancing draft through. S. C. Davidson  
Fuse casing and switch. L. W. Downes  
Game apparatus. J. H. Wilson  
Game apparatus. M. S. Brown  
Garment supporter. A. Frankenstein  
Gas burner. C. C. F. Schmidt  
Gas burner. Incandescent. J. Hutchinson  
Gas lighting apparatus. Time. P. Rouget  
Gas. Manufacturing. R. Dempster  
Gas or vapor lighting. Antivibrator for incandescent. C. Scott-Snell  
Gas purifying apparatus. C. I. Tenney  
Gate. W. T. Curtis  
Gear. Transmission. W. W. Adams  
Glass articles. Apparatus for making hollow. J. Proeger  
Glass chipping machine. F. H. Burch  
Glass drawing bait. J. H. Lubbers  
Glass or fabrics. Coating. H. Keppler  
Glassware. Apparatus for making. J. Proeger  
Glassware. Apparatus for the manufacture of. J. Proeger  
Glassware. Machine for making. J. Proeger  
Governor for spring motors. Speed. F. R. Dault  
Grab opening, closing, raising or lowering apparatus. H. Shoosmith  
Grading and ditching machine. T. J. Gray

Grappling fork. A. C. Houdyshell  
Grater. J. Eckhardt  
Grinding apparatus. Knife. P. Belle  
Grinding mill. Ball. M. F. Abbe  
Hair singer. C. F. Lancaster  
Hame and horse collar. R. J. Hotchkiss  
Hammer. Power. W. E. Sheehy  
Hammer. Tack. C. S. L. Kennedy  
Hand hole cover. K. Park  
Hatching and brooding body. A. O. Sossna  
Hay rake. E. Henning  
Heading tool. M. Trauthen  
Headlight operating mechanism. G. F. Chapman  
Heater. S. G. Scanlan  
Heater. H. C. Tabrett et al  
Hoe finishing machine. 3 pats. R. W. Thomson  
Heels or other parts of boots or shoes. Machine for finishing. C. Pease  
Hinge or hay rack attachment. H. S. Cunningham  
Hoisting apparatus. S. L. G. Knox et al  
Hollow forms from pliable compounds. Machine for making. C. W. Jefferson  
Horse head stall. J. D. Flynn  
Horsehoof's tool box. J. Beggs  
Hose supporter. C. L. Welis  
Hot water heater. T. B. Lanier  
Hub. Wheel. G. M. Elliott  
Human body. Device for cooling or warming the. B. Robt.  
Hydrocarbon burner. J. S. Sherman et al  
Hydrocarbon burner. L. E. Coleman  
Ice creeper. O. E. La Parr  
Ice creeper. J. L. Thomson  
Ice saw. E. G. Howard et al  
Insufflator. A. Mueller  
Insulating draw bar or draft link for railway trains. H. E. Procuier  
Insulating substances. Manufacturing plates of. J. Justus  
Insulator for handled vessels. Heat. C. E. Allen  
Ironing board. Inclosed cabinet. J. Joval  
Jack. W. W. Dwiggins  
Jar closure. E. O. Hain  
Jeweler's tray. D. Goldsmith  
Journal box. H. C. McCarty  
Journal box. A. B. Gardella  
Kitchen table. M. B. Thomas  
Knife handle. J. La Croix  
Knotter. J. E. Freidinger  
Knitting mechanism. L. B. Wygant  
Lacing hook. Shoe. J. W. Edgerton  
Ladder. Adjustable step. J. D. Lynch  
Ladder. Knockdown. E. L. Harmon  
Ladder. Store service. P. J. Daemicke  
Ladder truck side frame. F. S. Seagrave  
Ladies. Stopper valve for casting. C. O'Connor  
Lamp. Incandescent gas. W. H. Payne  
Lamp. Signal. F. K. Wright  
Lamp socket. Incandescent. H. E. Meyers  
Lamp. Switch. C. F. Annett  
Lantern holder. G. H. Shrodes  
Latch. S. S. Niles  
Latch. J. Hadka  
Lath belt tightener. W. C. Kirk  
Lath. Column. W. C. Kirk  
Lath work support. W. C. Kirk  
Lawn stand. C. T. Campbell  
Leather stock. Machine for making pasted. P. Belle  
Ledger footings. Device for guiding. C. A. Shea  
Lever controlling mechanism. W. R. McKeen, Jr.  
Life pail. Marine. H. H. Herrenden  
Light shield. W. A. Burham  
Load retaining or releasing means. Vehicle. D. McLaughlin  
Lock. L. Faust  
Lock. E. H. Dimock  
Locomotive pilot and draw bar. Adjustable. E. R. Halesworth  
Locomotive. Road. R. H. Fowler et al  
Loom. W. Holcroft  
Loom dobbie leno motion. H. Bardsley  
Loom for weaving figured double pile fabrics. J. W. Smith  
Loom shuttle checking mechanism. J. P. Johnson  
Loom take up mechanism. W. I. Stimpson  
Loom take up roller. F. Ott  
Loom whip roll motion. W. Holcroft  
Lubricator. H. W. Fisher  
Lug strap holder. D. T. Shea  
Mail box. E. E. Reese  
Mail collection and delivery apparatus. C. C. Kitterman  
Malting. B. Berg  
Manure conveyor. Stable. L. R. Tompkins et al  
Marker. Adjustable land. J. E. Hagen  
Measuring device. Board. J. Mahon  
Measuring device for looms. Cloth. L. M. Phelps  
Meat chopping machine. W. Richter  
Mechanical movement. L. R. Tulloch  
Messenger box. District. A. V. Siler et al  
Metals from cyanid solutions. Extracting. J. A. Ogden  
Metallic tie. F. D. Young  
Metallic wheel. W. Meinrich  
Milk cooler or refrigerator. A. C. Suggs  
Moistener and sealer. Envelop. R. H. Strong  
Mold sanding machine. F. J. Wiles  
Motor control system. T. E. Barnum  
Motor cooling device. Explosive. H. J. Perkins  
Music box phonographic attachment. H. A. Gautschi  
Music holder. M. K. Bear  
Musical instrument controlling sheets. Adjustable spool for. E. G. Clark  
Musical instruments. Device for playing keyboard. B. F. Stowell  
Mutilating device. T. Wheatley  
Name or index plate holder. F. J. Cota  
Newspaper box. W. H. Zylstra  
Nitrocellulose or similar substances. Compound of. D. Bachrach  
Numbering machine. F. Sanders  
Nut lock. P. E. Myers  
Nut and washer. Lock. G. Bryar  
Oil burner. H. L. Sherwood  
Oil burner. Crude. E. W. Tucker  
Oil burner for heating purposes. G. S. Anderson et al  
Ordnance. A. T. Dawson et al  
Ordnance sighting and firing apparatus. H. W. Jones  
Ore separator. J. W. E. Allen  
Ores. Crushing and stamping. J. C. Anderson  
Oxygen into ozone. Apparatus for converting. 2 pats. F. S. Blackmarr et al

Oxygen into ozone. Converting. F. S. Blackmarr et al  
Package carrier handle. T. J. Soden  
Packing. R. M. Shaffer  
Packing. Piston rod. C. P. Fogh  
Packing press. N. L. Elliott  
Packing. Valve stem. J. H. Hooper  
Paint or varnish. Composition for removing. C. L. Beck  
Pantograph. A. Forbes  
Paper bag holder. W. M. Nix  
Paper clip. D. A. Hazard et al  
Paper holder. C. O. Young  
Paper, &c. Machinery for cutting and folding. E. H. Cottrell  
Pasting machine. W. J. Dix  
Paving strip. L. Vogel  
Pen. Fountain marking. J. Berg  
Pen. Recording. F. A. Jones  
Pen. Ruling. D. M. Hall  
Permutation lock. I. G. French  
Permutation lock. J. D. Foster  
Piano music desk. R. S. Bowen  
Piano player. C. S. Warren  
Piano support. Elastic. J. Beaumle  
Picture exhibiting apparatus. T. Armat  
Picture exhibiting machine. W. W. Rosenfield  
Pigment and making same. W. J. Armbruster  
Pipe coupling. Line. H. B. Schrader  
Piston. O. Kelsey  
Planter and fertilizer distributor. Combined seed. P. J. Stevens  
Planter. Corn. C. M. Stevenson  
Plastic compound. C. E. Gale  
Plate shears. F. Fuchs  
Pole coupling. Reach. C. Trim  
Polishing implement. E. E. Broadhurst  
Pool ball frame. R. D'Abamo  
Poultry picking machine. F. & B. E. Terwilliger  
Power transmission device. H. Gerdes  
Precious metals from cyanid solutions. Apparatus for extracting. J. A. Ogden  
Press for ribbons, &c. W. Y. Fuqua  
Printing apparatus. J. H. Ketcheson  
Printing frame. E. F. Galloway  
Printing machine. Multicolor. F. H. Mowbray et al  
Printing press. 3 pats. M. L. Severy  
Printing presses. Composition for preventing adhesion of paper to rubber in. F. Pape  
Propelling and steering apparatus. Vessel. J. Dupuis  
Pump. Electric. O. G. Doherty  
Punching press. Multiple. W. Crossley  
Puzzle. C. Denison  
Quick action wrench. J. Talbert  
Radiator. W. C. Pease  
Rail joint. J. Booth  
Rail joint. R. J. Weiken  
Rail joint. W. A. Aughinbaugh  
Rail or bar straightening apparatus. J. Smith  
Rail repairing or splicing device. O. D. Binett  
Railway. Elevated. C. I. White  
Railway gate. W. A. Aughinbaugh  
Railway station signal. J. L. Wrenn  
Range. J. F. Ruth et al  
Ratchet wrench. J. E. Stuchair  
Recreation device. J. Wilson  
Revolving case. J. Poole  
Roller mill scraper. G. F. Thompson  
Rotary engine. E. W. Bull  
Rotary engine. M. D. Kalbach  
Rotary kiln. W. Michaelis, Jr.  
Rubbing and polishing machine. C. S. Yarnell  
Sad iron. W. W. Lamb  
Sad iron. F. C. Lowthrop  
Safety hook. R. B. White  
Safety pin. J. W. Casper et al  
Saw table gage. R. Mancha  
Saw teeth. Machine for gumming and straightening. J. H. Thayer  
Scale. Spring balance. J. W. Culmer et al  
Screen. L. E. Gaylord  
Scythe. S. S. Elder  
Sealing means. Bottle. E. Goldstein  
Salvage motion. Center. H. Bardsley  
Separating and grading machine. D. Sewell  
Separator. W. G. Read  
Sewing machine. Multiple buttonhole. G. H. Arakelian  
Sewing machine shuttle. J. O. Huffman  
Shaft coupling. G. L. Estes  
Shaft hanger. E. V. Cresson  
Shaft stop collar. Power. O. Rudd  
Sheep shears. O. Bors  
Sheet metal grinding or polishing machine. J. Muller  
Sheets fed to lining or other machines. Means for turning the. F. F. Forste  
Ship's air and light port. T. Utley  
Shock loader. D. J. Green  
Shoe bow. S. L. Pratt  
Shoe fastening. L. A. Boehme  
Shower bath. J. J. Butcher  
Shuttle. J. C. Sergeson  
Signal apparatus. C. J. Coleman  
Siphon filter. H. A. Allwardt  
Sled runner. J. Mann  
Snatch block. F. M. Eby  
Snatch block. D. E. Welsh  
Soapsuds. Treating hot refuse. S. Turner et al  
Solder to vessels. Mechanism for preparing and applying. W. Rubin  
Sole and heel edge trimming machine. F. L. Champine  
Soles. Apparatus for applying cement to. G. L. Rollins  
Sound receivers or transmitters. Sanitary attachment for. A. Levl  
Spacing mechanism. W. C. Bray  
Speed and reversing mechanism. Variable. W. Decker  
Speed indicator. Magnetic. 2 pats. S. B. Storer  
Spike pulley. G. Bryar  
Spinning material. Preparing. E. Mundorf  
Spinning ring. D. Harrington  
Spoke. Vehicle wheel. C. L. Schwarz  
Spoke. Vehicle wheel metallic. T. Midgley  
Spring cushioning device. C. P. Byrnes  
Spring point switch. E. J. King  
Square. Carpenter's framing. W. B. Mahan  
Square. Tailor's measuring. T. R. Boone  
Stacker. J. W. Heaton  
Stamp. Hand. A. M. Comstock  
Stamp mill machinery. J. C. Anderson  
Stamp sectional cam. Ore. A. P. J. Bossell  
Steam boiler. W. B. Gregg  
Steam engine. J. J. Reilly  
Steam generator. F. Gruenewald  
Steam trap. R. D. Tackaberry

Steam trap. E. Hippard  
Steel. Manufacture of. R. A. Hadfield  
Steel plates. Cutting. E. W. Lewis et al  
Stereotype matrix frame. J. C. Bonneau  
Stereotype or electrotype matrices and printing blocks. Machine for producing. A. Kraus et al  
Stirrup. A. F. Wood  
Stone. Molding. A. Lake  
Stop mechanism. W. A. Walker  
Stove and grate therefor. J. Gregory  
Stove and heater. Combined gas. J. R. Allan  
Stove valve. Vapor. W. F. Guese  
Supporter. F. E. Griffith  
Surgical device for setting fractured legs. J. Scheidl  
Surgical pad. G. H. Gormore  
Swing. G. E. Knowlton  
Switch operating mechanism. Snap. C. G. Perkins  
Syringe. C. S. Ruckstuhl  
Syringe. Hypodermic. J. H. McNeill  
Tablet dispensing machine. W. G. Buelne  
Taylor's shears. J. Polkowski  
Tapping machine. R. C. Lewis  
Telegraph. Printing. W. S. Steljes  
Telegraphy. Wireless. reissue. 2 pats. R. A. Fessenden  
Telephone circuits and apparatus. G. K. Thompson  
Telephone exchange. Automatic. M. C. Rorty et al  
Telephone exchange system. G. L. Craig  
Telephone exchange system. J. C. F. Malthaner  
Telephone relay or step up. G. E. Sundquist  
Telephone system. G. Babcock  
Telephone system. Central energy. W. A. Taylor  
Telephone tablet attachment. G. M. Urie et al  
Telephone transmitter. A. Stromberg  
Telephonic communication system. J. T. Armstrong et al  
Tellurian. W. Gentry  
Thermostatic pole changer. J. P. Jensen  
Thread dressing machine twisting head. G. A. Fredenburgh  
Threshing machine. E. W. Flagg  
Tile. Metal roofing. A. H. Memmler  
Tire repair tool. T. Weigle  
Toaster. Bread. L. F. Butler  
Tobacco picker's frame. J. J. Kelly  
Tongs. Pipe. J. P. & H. M. Thoman  
Tool. Combination. D. N. Tarbox  
Tool. Combination. G. W. Daniels  
Tool. Impact. T. H. Phillips  
Toy. E. S. Savge  
Toy. E. R. George  
Traction engine. J. B. Barino omew  
Traction separator. V. W. Clough  
Traction wheel. D. B. Speck  
Trolley pole controlling apparatus. J. L. Bogue et al  
Trolley signal. C. H. Morse  
Trolley stand. F. Kennington et al  
Trousers pressing and holding device. J. T. Donaldson  
Trousers stretcher. F. H. Wood  
Truck bolster. H. T. Anderson  
Truck. Car. E. W. Samen  
Truck. Lateral motion arch bar. C. H. Read  
Trunk and fittings. Wardrobe. I. Mendel et al  
Tube cleaner. H. F. Weinland  
Tug. Hame. E. V. S. Guichard  
Turbine governor. Elastic fluid. O. Junggren  
Turbine wheel. Elastic fluid. P. J. Hedlund  
Twine holder. F. P. Jarrett  
Type writing and computing machine. Combined. H. Marshall  
Umbrella. T. W. Ford  
Upholstering device. J. L. Heffer  
Urinal flushing and ventilating apparatus. J. L. Reau et al  
Valve. C. E. Huxley  
Valve. J. F. McElroy  
Valve. C. W. A. Koelbeck  
Valve. Flush. C. W. Lendh  
Valve for water heaters. Gas and water regulating. J. W. & G. H. Ewart  
Valve gear. Explosive engine. W. J. McVicker  
Valve gear. Reversing. A. B. Brown  
Valve. Lever operated. G. G. Wickson  
Valve mechanism. Explosion engine regulator. J. Ellis  
Vaporizer. H. Harris  
Vehicle antivibration device. J. M. M. Truffault  
Vehicle brake mechanism. O. Minton  
Vehicle construction. Motor. A. G. Roman  
Vehicle wheel. W. Laatsch  
Vehicle wheel. C. W. Boykin  
Vending machine. L. Pedersen  
Veneer coiling and nailing machine. M. J. Bartlett  
Ventilator. E. P. Oliver  
Vessel safety alarm device. Marine. M. Shepard  
Vibratory motor. Electrical. C. S. Whitney  
Warp stop motion apparatus. H. W. Owen et al  
Water heater. M. Henkle  
Water jacket. F. Kiepetko  
Water wheel balancing device. F. Trump  
Well rod extractor. W. W. French  
Whip. M. O. Felker  
Windlass. J. O. Toole  
Window cleaning device. M. Anderson  
Window opener. J. Leonius et al  
Window. Revolving metallic. L. Christenson  
Window washing apparatus. S. C. Lawlor  
Wire working tool. W. Liechty  
Work support. A. L. Nettles et al  
Wrench. R. H. A. Geistert  
X-ray tube. J. O. Heinze, Jr.

## DESIGNS.

Box. K. M. Chapman  
Finger ring. C. T. Wittstein  
Handkerchief. E. Bendheim

Issued November 17, 1903.

## MECHANICAL PATENTS.

Addressing machine. A. B. Hunkius  
Advertising card. J. L. Bieder  
Albuminoid substances from maize. Making. E. Donard et al  
Amalgamator and concentrator. T. B. Lee  
Anchor post. W. M. Small



- Animal trap.....J. M. Mast  
Apron. Storm.....reissue.....J. C. Crimins  
Arm rest.....R. H. Brasel  
Atomizer.....J. Pierce  
Automatic friction brake.....A. Sedgwick et al  
Automatic switch.....J. M. Comer  
Awl. Sewing.....W. M. Mansell  
Awls. Shuttle for use with sewing.....E. B. McCann  
Axle.....M. R. Gustin  
Axle brace.....C. Schneider, Sr  
Bag filler and holder.....M. E. Hall  
Bag filling machine feeder.....F. Dedreux  
Bag, reticule, or the like.....A. Amson  
Bail mill. Tubular.....M. F. Abbe  
Band. Spring.....R. C. Kisting et al  
Bandage. Suspensory.....E. R. Drake  
Barrel cover. Adjustable.....E. Bertelsmann  
Barrel head.....E. E. Davenport  
Bathing apparatus.....L. V. Levinger  
Beading strip.....H. S. Hale  
Bed spring.....T. J. Ridgway et al  
Belt attachment. Waist.....A. T. Goldfield  
Belt fastener.....H. T. Jones  
Bicycle driving mechanism. Chainless.....C. Stollewerk  
Bicycle support.....M. Henoch  
Bicycles, &c. Driving mechanism for.....A. T. Brown et al  
Binder. Temporary.....A. Lawson  
Boiler acid proof lining.....R. Panzl  
Boiler brace.....J. A. Dailey  
Boilers clean. Device for keeping.....J. W. Robinson  
Bolt and nut locking device.....G. W. Oliver  
Bolts or rivets. Manufacture of.....A. H. Fox  
Bone cutting machine.....C. Trick  
Book or tablet. Manifolding.....G. Gubbert  
Book protector.....G. B. Norton  
Boot or shoe.....J. N. Moulton  
Bootjack.....S. S. Thompson  
Boring bar.....W. H. Boardman  
Bottle.....C. E. McClellan  
Bottle. Non refillable.....M. M. Kearney  
Bottle. Non refillable. 2 pats.....W. S. Burnett  
Bottle. Non refillable.....G. W. Shook  
Bottle stopper.....W. S. Barnett  
Bottle washing machine.....H. C. Vogel  
Bottle washing machine.....H. C. Kennedy  
Bottles or vessels. Closing.....E. Kitzert  
Box.....E. A. G. Bierwirth  
Box covering machine.....P. S. Smith  
Box lid fastener.....C. W. Walters  
Boxes. Making.....J. Schmidt, Jr  
Brake beam.....W. P. Bettendorf  
Brick making machine.....E. R. Sutcliffe  
Brick, tile, or pottery kiln.....W. B. Hughes  
Bricks or blocks. Making.....E. R. Sutcliffe  
Broom binder.....H. W. Langham  
Brush.....L. G. Kelly  
Buggy attachment.....A. M. Rye  
Building block. Hollow.....H. L. Bynum  
Building stirrup.....W. B. Gervais  
Calculating machine.....C. Stalberg  
Calipers. Beam.....C. E. Billings  
Camera. Photographic.....F. W. Brehm  
Camera plate holder changing box.....L. Darlington  
Can filling machine.....2 pats.....A. erruti  
Can heading machine.....C. Stecher et al  
Candlestick.....2 pats.....W. Nicol et al  
Car and line indicator for street railways.....H. D. Haggerty  
Car brake.....A. M. Kendall  
Car brake.....J. B. Lau  
Car coupling repairing device.....O. P. Wilhelm  
Car. Dump.....H. S. Hart  
Car. Dump.....F. S. Ingoldby et al  
Car electric alarm signal. Railway.....D. N. Jordan  
Car. Metal dump.....S. Otis et al  
Car. Railway.....H. J. Bayard  
Car wheel.....D. H. Nickerson  
Car unloader and carrier feeder. J. S. Williams  
Cars. Metallic end yoke for railway.....S. W. Kimbrough et al  
Cars. System of electric lighting for.....C. P. Tooman  
Caramel cutting and wrapping machine.....2 pats.....H. Y. Armstrong  
Carbonizing.....B. Zwilling  
Carbonizing and cooling down the charge.....B. Zwilling  
Carbonizing apparatus.....B. Zwilling  
Carbonizing apparatus.....B. Zwilling  
Carburetor. Explosion engine.....T. L. & T. J. Sturtevant  
Cards. Playing.....H. S. Delamere  
Carpet lining.....J. McGwin  
Carpet renovator.....J. S. Thurman  
Carpet sweeper bail handle.....T. I. Duffy  
Carriage top prop.....F. A. Neider  
Cartridge capping, decapping, and loading device.....J. E. Krewson  
Caskets. Supplemental bottom for transportation.....C. A. Genung  
Cast off.....R. F. Bartel  
Caster.....M. G. Daniels  
Caster removing device.....E. G. Lewis  
Cattle guard.....F. M. Wright  
Cave.....F. J. & G. W. Hubbell  
Ceiling construction.....W. D. Ryan  
Cement water tanks. Apparatus for forming.....J. T. Donahoo  
Centrifugal machine.....J. A. Willard  
Change maker.....J. M. Butcher et al  
Change receiver.....W. Sinclair et al  
Charcoal or coke oven.....A. T. Wilson  
Checkrein fastener.....M. MacMillan  
Chemical compound.....J. Mellinger  
Chimney top.....E. H. Be Beau  
Circuit breaker.....S. B. Stewart, Jr  
Circuit controller.....A. Lungen  
Circuit protector. Thermal.....O. C. Hoffmann  
Clasp.....G. B. Adams  
Clock dial.....D. S. Kanstoroom  
Clock. Electric program.....J. W. Portis  
Clock movement.....F. A. Jones  
Clothes line clamp.....J. Rupp et al  
Clothes punder.....L. S. & E. M. Elliott  
Clothing hanger. Traveling.....A. Pederson  
Clutch and brake mechanism. Electrical.....A. P. Steckel  
Clutch. Automatic release.....H. J. Hinde  
Coat collar. Detachable.....W. Joel  
Coatings on metallic objects. Depositing metallic.....A. Darlay  
Coil forming apparatus.....E. L. Aiken  
Collapsible or folding box for fruit, confectionery, pastry, &c.....G. W. King  
Collar blank.....G. J. Dormandy  
Collar supporter.....A. P. Howes  
Collars, stocks, &c. Means for supporting.....M. George  
Column. Wood.....E. Koil  
Comb dabbng brush mechanism.....A. J. O'Reilly  
Commutator.....C. H. Ingalls  
Computing device.....B. E. & F. J. Anglund  
Concentrating surfaces. Preparing.....A. D. Foote  
Conduits. Implement for laying underground.....M. Kondolf  
Controller.....T. von Zweigbergk  
Conveyer. Portable.....J. A. Brown  
Conveyer. Traveling.....E. Baltzley  
Corn header. Kafir.....R. M. Hammond  
Corn sheller.....J. R. Duhachek  
Corrugating machine.....C. Puddefoot  
Corset.....A. V. Case  
Cotton feeders. Automatic alarm for.....O. A. Bremer  
Counting mechanism.....F. C. Rinsche  
Coupling.....2 pats.....R. M. Dixon  
Crane and appurtenances.....A. A. de Bonneville et al  
Crate. Animal.....W. A. Stewart  
Crate. Knockdown.....O. C. Crumpton  
Cream separator.....B. F. Bradbury  
Crushing roll.....M. Condule  
Cuff holder.....H. H. Walley  
Cuff holder.....G. G. Corbet  
Cultivator. Lister.....T. S. Warner  
Curling iron.....C. O. Sterling  
Curtain pole support.....E. A. Porter  
Curtain support.....L. A. Emery  
Cuspidor.....M. Rosenzweig  
Cycle or air tubes. Protecting mantle for.....C. A. Leske  
Decoration and making same.....J. D. Kyle  
Defibrator. Four way.....J. F. Beard et al  
Dental lip and cheek supporter.....J. B. Jordan  
Dentimeter.....C. T. Kinsman  
Denture. Anchored.....2 pats.....C. M. Carr  
Die stock. Adjustable.....B. Borden  
Digesters. Composition for acid-proof lining of.....2 pats.....R. Panzl  
Dipper or skimmer.....G. T. Kinch  
Disinfecting telephone transmitter mouthpieces. Means for.....M. Griffin et al  
Dispensing cabinet and measuring scoop therefor.....W. S. Thomas  
Display device. Card.....R. B. Friend  
Display device. Extensible.....M. M. Fletcher et al  
Display frame.....W. A. Decker  
Door opener or closer.....T. L. How et al  
Draft evener.....C. C. & W. D. Dillavan  
Drag. Field.....J. F. Rodgers  
Dredger cutter head. Suction.....M. C. Harris  
Dredging machine bearing.....P. Small  
Drier.....2 pats.....E. R. Edson et al  
Drying apparatus.....W. Straw  
Drilling machine.....2 pats.....G. B. Pickup  
Dust collector.....J. S. Thurman  
Dust can.....F. Strasser  
Dyeing apparatus.....J. A. Willard  
Electric coil terminal.....R. Varley  
Electric lighting apparatus. Portable.....E. R. Gill  
Electric machine. Dynamo.....G. Macloskie  
Electric machines. Winding dynamo.....J. B. Wiard  
Electric machines. Winding for dynamo.....J. B. Wiard  
Electric meter.....G. Stern  
Electric motor.....R. Eickemeyer  
Electric traction system.....L. T. Gibbs  
Electrical apparatus. Forming coils for.....E. L. Aiken  
Electrical storage cell.....J. A. Lyons et al  
Elevator.....W. H. Hultgren  
Elevator door operating mechanism.....H. C. Seipp  
Elevator safety appliance.....W. Lasar  
Embroidery hoop. Adjustable.....H. A. Harnes  
Engine controlling mechanism. Gas.....L. S. Chadwick  
Engine muffler. Explosive.....R. C. Shepherd  
Engine piston. Steam.....J. Swan  
Envelop. Clasp.....J. C. Kimsey  
Excavating machine.....W. Cole  
Excavating mechanism.....W. Cole  
Exhibiting device. Goods.....M. J. Bebb et al  
Explosive engine.....B. G. Holz  
Eyeglass bridge.....W. H. Ely  
Eyeglasses.....E. W. Bancroft  
Eyelet. Boot or shoe.....J. Frye  
Feed box.....G. L. Theige  
Feed water filter.....J. F. Barrett  
Feed water heater.....H. J. Gebhardt  
Feed water heater and circulator.....R. B. Hodge  
Feeder. Gravity boiler.....F. W. & H. L. Shupert  
Fence post.....A. F. Hein  
Fence post.....C. H. E. Meyer  
Fence stapling device. Wire.....M. Church  
Fifth wheel connection.....L. W. Mowery et al  
Filament cleaning device.....J. W. Howell  
File. Bill.....G. H. Maurer  
File cabinet.....I. H. Athey  
File for checks, &c. Assorting.....W. S. Jewell  
Finger ring.....H. Pizer  
Fire curtain.....J. W. Reno  
Fire escape.....G. A. Netcott  
Fire extinguisher.....W. J. Fry  
Fire extinguisher. Automatic stationary.....W. Esty  
Fires in oil filled receptacles. Extinguishing.....R. D. Merston  
Fireplace fuel support. Open.....A. A. Low  
Fish hook shield.....A. W. Bishop  
Fishing reel.....O. Allen  
Flash lamp.....F. G. Walter  
Flash lamp. Storage.....M. Klaiber et al  
Flash light attachment. Camera.....J. H. Hammer  
Fluid pressure regulator.....E. R. Cook  
Fruit chopper and press.....E. Ernst  
Fuel burner.....A. Neu  
Furnace.....E. H. Wade, et al  
Furnace.....J. D. Roberts  
Furnace charging apparatus.....C. Eitle  
Furnace or stove fire pot.....F. D. Swaney  
Furnaces. Support for cooling plates or coils in bath.....A. Farrell  
Fuse for exploding shells. Percussion.....K. Wieser  
Gas analyzing apparatus.....C. C. Tutwiler  
Gas burner.....W. B. Carrick  
Gas burner. Petroleum.....M. Ghiglieri  
Gas burning heater.....L. F. Betts  
Gas. Making.....L. Mond  
Gas meter register.....J. C. Goodale, Jr  
Gas regulator.....E. R. Cook  
Gate.....G. M. Bates  
Gate.....A. L. Trumbo  
Gear case and bracket.....H. De Wallace  
Gear case. Miter.....H. De Wallace  
Gear cutting machine.....C. D. Rice  
Gear. Reversing.....E. L. Shore  
Glass beveling machine.....P. E. Welton  
Glass. Machine for automatically gathering and delivering.....W. F. Altenbaugh  
Gopher trap.....C. H. Birdsall  
Governor. Gas engine.....J. S. Thurman  
Governor. Inertia.....F. D. Howe et al  
Grader. Pneumatic.....W. S. Osborne et al  
Grain binder knotting mechanism.....J. F. Appleby  
Grain cleaner riddle.....E. Early  
Grain drill.....J. A. Lussier  
Grain separator.....H. J. Silvis et al  
Graphite lubricator.....R. Pielicke  
Grapple.....M. S. Meaders  
Grater.....O. J. Schroeter  
Grinding mill.....M. F. Abbe  
Grinding mill.....W. B. Collins  
Gun carriage. Machine or other.....T. K. North  
Gun sight.....B. P. Vickery  
Hair drying device.....E. Burnham  
Harp.....2 pats.....J. A. Rath  
Harrow.....S. Prejean et al  
Harvester binders. Drive or master wheel divider for.....J. Waldbrook  
Harvester. Corn.....J. F. Leeper  
Harvesting machine.....W. N. Whitely  
Hat die.....M. Quinn  
Hay elevator.....D. E. Rowland  
Hay or straw cutter.....T. Frtschek  
Hay press door closer.....J. M. Dolan  
Heel building machine.....F. H. White  
Hinge.....G. S. Bronson  
Hinge. Blind or shutter.....C. Purrington  
Hinge. Lock.....J. Schick  
Hoist. Pneumatic.....C. H. Reeder  
Hoisting apparatus safety device.....M. H. Read  
Hoisting device.....J. Hayward  
Horse overshoe.....J. E. Hoffman  
Horseshoe.....F. J. Bacon  
Horseshoe.....A. Carr  
Horseshoe making machine.....W. Stellner  
Hose coupling.....M. E. Henderson  
Hose coupling.....F. A. Moore  
Hose coupling.....F. A. Silvis  
Hydrocarbon burner lighting device.....L. Stockstrom  
Hydrocarbon engine.....J. C. Meredith  
Hydrocarbon paste. Discharging with.....L. H. Dehoff  
Indian club. Illuminated.....M. M. Hurst  
Indigo powder. Light.....P. Seidel  
Injector or ejector.....W. D. Labadie  
Ink well. School desk.....M. D. Gaines  
Insulator.....E. F. Schuethaler  
Jaguard machine.....W. W. Hodgson  
Kinestoscope.....A. E. Smith  
Kitchen utensil.....R. B. Ligon  
Knitting machine.....J. C. Duemler  
Knockdown bracket.....H. G. Voight  
Lacework holder.....A. Proctor  
Lamp burner. Incandescent gas.....M. Graetz  
Lamp. Electric arc.....J. McLaughlin  
Lamp. Electric arc.....E. Thomson  
Lamp. Incandescent electric.....C. A. Crane  
Lamp. Miner's.....L. J. Husson  
Lamp. Safety.....G. W. Reilly et al  
Lampsocket. Electric.....J. H. Goelst  
Lathe grinding attachment.....J. N. Heald  
Lawn sweeper.....J. F. Battle  
Leaf or sheet turner.....W. A. Moulton  
Life saving device.....J. Moore  
Lighting arrester.....H. E. Raymond  
Line holder.....H. L. Marks  
Linotype leader.....J. A. Proulx  
Linotype machine.....O. Mergenthaler et al  
Liquid cooler.....O. Roderwald  
Liquid dispensing apparatus.....M. Masterson  
Liquid fuel heater burner.....J. T. Pedersen  
Liquid testing device.....V. Spieschka  
Loading machine, &c. Apparatus for W. Fischer  
Lock and latch.....H. G. Voight  
Locomotive.....2 pats.....J. Player  
Locomotive Electric.....4 pats W. Dalton et al  
Locomotive frame.....J. Player  
Locomotive lubricator.....E. Sarver  
Locomotive parallel rod.....C. Houston  
Loom.....E. Vahle  
Loom box motion.....G. Goodline  
Loom. Lappet.....F. J. Dearden et al  
Loom protective mechanism.....W. A. Fowler  
Loom shuttle box operating mechanism.....2 pats.....G. Goodline  
Loom. Weft replenishing.....W. Rossetter et al  
Lubricating.....W. Michalk  
Machine clamp.....D. T. Kendrick  
Magnet.....H. F. Campbell  
Magneto electric generator.....L. J. Le Pontois et al  
Mail tube fastening.....H. Del Mar  
Malt breaking mill.....H. Krusemark  
Mangle.....C. T. Gilmore  
Manure spreader.....F. F. Freed  
Marking board.....F. Moehle  
Match box.....C. Hering  
Match box.....M. V. Kerley  
Match box.....P. Schick  
Match safe.....F. King  
Match stick making and racking machine. Combined.....W. Scharnweber  
Meat slicer sharpening attachment.....W. A. Van Berkel  
Mechanical drill.....G. B. Pickup  
Mechanical movement.....W. H. Voss  
Mechanical movement.....E. A. Faller  
Mixing apparatus. Pneumatic.....A. Gillies  
Milking apparatus. Teat cup for pneumatic.....A. Gillies  
Mirror decorating and illuminating device.....S. G. Doherty  
Miter box.....R. B. Briggs  
Miter clamp.....J. F. Jacobs  
Moistening device.....P. J. Alwart  
Molding machine.....J. Anderson  
Mop and wringer therefor. Combined.....E. Hilker  
Mosquito canopy.....B. F. Childress  
Motor control. Device for alternating current.....J. L. Davis  
Motor controllers. Time limit device for.....F. B. Corey  
Motor controlling device.....C. A. Dresser  
Mower grass receptacle. Lawn.....L. Wildermuth  
Mower. Lawn.....F. M. Wolfe  
Mower, &c. Cutting apparatus for B. G. Palmer  
Mowing machine.....W. N. Whitely  
Muffler.....W. H. Corse  
Music holder.....W. E. Barnard  
Music rack.....R. W. Norton  
Musical instrument.....H. E. Hibshman  
Musical instrument. Mechanical.....C. L. Davis  
Necktie form.....J. S. Hull  
Novelty device.....W. M. Hervey  
Nut lock.....R. A. Rehner  
Nut lock.....G. A. Kennedy  
Nut lock.....J. A. Schlehr  
Nut lock. Axle.....F. J. Grant  
Oil burner spreader.....H. P. Akers  
Oil can.....F. K. Bell  
Oil for heating purposes. System for burning.....L. D. Lovekin et al  
Oil reservoir or tank.....R. H. F. Sewall  
Ophthalmometer or other tables.....W. F. Reimold  
Ore concentrator.....J. W. Pinder  
Ore concentrator. Fine.....F. L. Bartlett  
Ore feeder.....L. R. Tulloch  
Overhead switch.....W. Louden  
Ozonizer.....M. Otto  
Package elevator.....S. B. Peck  
Packaging machine.....A. Day  
Packing for spindle bolsters. Spring.....G. M. Burgess  
Packing or shipping box.....P. A. Reno  
Paddle wheel.....G. L. Hamling  
Paint and varnish. Composition for removing.....G. Osborn  
Paper board creasing machine.....J. King, Jr  
Paper clip.....H. E. Gifford  
Paper cutting device.....F. Soennecken  
Paper cutting machine.....N. Gray, Jr  
Paper from cylindrical cores. Machine for removing waste.....J. S. Wemyss  
Paper holder.....A. E. Sexton  
Paper. Manufacture of.....R. D. Smith et al  
Paper, such as toilet paper, &c. Device for the containing and delivery of sheets of.....E. D. Casterline et al  
Paving.....J. Heenan  
Pen.....F. M. Kegrize  
Pen filling device. Fountain.....L. Fisk  
Pen. Fountain.....H. W. Stone  
Penholder.....C. M. Cook  
Pencil.....A. E. Buckingham  
Phonograph cylinders. Apparatus for the manufacture of.....A. Haug  
Phonographic recorder and reproducer.....P. Weber  
Phonographic repeating mechanism.....P. Weber  
Phonographic developing apparatus.....E. E. Park  
Photographic plate developing apparatus.....J. D. Lyon  
Photographic printing apparatus N. H. Brown  
Photographic reproductive process.....E. Ortmann  
Photographic stick stands. Handle for.....G. Geiger  
Piano or organ bench.....D. Schustek  
Pianolas or other musical instruments. Expression mechanism for.....R. W. Spring  
Pie making machine.....H. H. Paine  
Pile shoe.....J. A. Steinmetz  
Piling. Metal sheet.....F. N. Kneas  
Planter. Pindal.....A. Tyler  
Planter. Potato.....G. H. Elmer  
Plate rack.....F. A. Ecker  
Platen to the line spacing mechanism. Device for adjusting the.....A. W. Steiger  
Pliers and pipe wrench. Combination.....J. R. Collins  
Plow.....J. Clayton  
Pocket knife.....H. Goldin  
Pocket or pouch. Safety.....H. M. Eldred  
Poke. Animal.....W. S. Brown  
Printing collapsible tubes. Machine for.....F. F. Ingram  
Printing or other machine blanket.....R. J. C. Mitchell  
Printing press.....W. A. Logue  
Printing press gripping device.....S. Halvorsen  
Printing, stamping, and embossing press.....W. N. Rockstroh  
Propulsion. Means for canal boat.....G. H. Mann  
Pulverizer.....2 pats.....H. Moor  
Pump.....I. B. Robertson  
Pump. Automatic.....W. F. Carlberg  
Pump coupling. Windmill.....C. W. Decker  
Pump. Double plunger.....R. Addison  
Pump. Rotary.....T. T. Johnston  
Pumping engine.....E. Hill  
Purse.....J. C. O'Shea  
Quick break switch.....H. R. Sargent  
Rail fastening and tie plate. Combined.....R. G. Polster et al  
Rail joint.....A. S. Lanum  
Rail joint.....A. B. Tomlin  
Rail joint.....C. H. Little  
Rail joint.....C. H. Shobert  
Railway rail clamp.....C. A. Sanborn  
Railway rail joint.....J. R. Hubbard  
Railway signal.....M. D. Haulon  
Railway signaling apparatus.....J. A. Norton  
Railway signaling system.....J. Shoecraft  
Railway switch.....G. C. Calentine  
Railway system. Electric.....W. Embley et al  
Railway system. Electric.....2 pats.....A. A. Shobe et al  
Railway tie. Metallic.....R. Black  
Railways. Combined signaling and telephonic intercommunicating system for.....J. A. Whyte et al  
Ram for hydraulic jacks.....H. J. Riedel  
Razor stropping device.....J. A. Butler  
Receptacle. Flexible.....J. C. O'Shea  
Reflector.....D. J. O'Brien  
Refrigerating apparatus. Means for determining the quantity of liquid in.....J. Small  
Rein hold.....C. W. Walker  
Resawing machine.....J. C. Lawhon  
Roasting furnace.....F. Klepetko  
Rolling mill.....C. M. Grey  
Rope clip.....B. C. Riblet  
Rotary engine.....F. M. Comstock  
Rotary engine.....C. Bowers  
Rotary engine.....M. A. Rice  
Rotary engine. Reversible.....E. S. Ward  
Rotary engine. Reversible.....E. Hemstrom  
Roving mechanism.....N. N. S. Dandelin  
Rule. Garment drafting.....J. P. Buckley  
Saddle.....S. S. Moore  
Sash fastener.....J. W. Buchanan  
Sash lock.....W. B. Weaver  
Sawmill set works.....T. S. Wilkin  
Saw set.....W. C. Morrill



Saw table..... E. T. Gorham  
Scaffolding. Knockdown..... W. Harrison  
Scale. Weighing..... F. W. Grey  
Scow, Deck..... W. Y. Gambee et al  
Seal lock seal..... 2 pats..... C. J. Reynolds et al  
Securing means. Adjustable..... H. M. Pilkington  
Sewing device..... O. Knorr  
Sewing machine..... J. A. Cameron  
Sewing machine fan attachment..... O. G. Ogden  
Shade bracket..... J. B. Landry  
Shade bracket. Window..... A. J. Signor  
Shade fixture. Window..... J. Wheat  
Shaking tables, &c. Movement for.....  
..... F. L. Bartlett  
Sheet metal elbows and pipe. Device for crimp-  
ing..... J. Baemle  
Shelves or other articles. Support for.....  
..... C. E. Wilton  
Ships when not under way. Means for turn-  
ing or swinging..... J. B. Blair  
Shoe creasing device..... E. Roraback  
Shoe tray..... C. D. Whiting  
Shoe tree..... G. E. Belcher  
Shoes. Making turned welt..... M. J. Moloney  
Show case..... J. Clayton  
Shuttle box motion..... J. S. Ainley  
Shuttle driving mechanism..... C. E. Brouillette  
Sieve or strainer..... J. Frye  
Sign. Cement..... R. B. Emerson  
Sign. Electrically illuminated..... J. H. Goehst  
Signals. Lubricating device for train order.....  
..... H. De. Wallace  
Signaling. Electrical ringing of bells for sub-  
marine..... E. Gray  
Skirt protector. Woven..... G. S. Hensel  
Slicer..... E. S. Regnier  
Smelter. Prospector's..... B. F. Daniels et al  
Smoke consumer..... J. Toohey  
Smoke stack attachment..... G. C. Rand  
Snap hook..... W. A. Schleicher  
Soap frame..... H. D. Winton  
Sole stretching machine. Boot or shoe.....  
..... C. R. Johnston  
Sound box for sound recording and reproduc-  
ing machines..... E. H. Mobley  
Speed mechanism. Variable..... N. D. Chard  
Speed varying mechanism..... W. D. Hoffman  
Spigot..... G. Underwood  
Spokeshave..... H. Sarasin  
Spout. Sectional and adjustable discharge  
..... A. Rosenthal  
Spring clip..... reissue..... G. W. McGill  
Spring motor..... W. U. Colthar  
Stacker. Straw..... E. T. Dunn  
Stair rod and securer..... S. A. Brown  
Stair rod fastening..... J. P. Stahl  
Steam boiler. Locomotive..... P. Burk  
Steam boiler. Stationary..... P. Burk  
Steel hardening composition..... G. Kolb  
Steam into centrifugal machines. Apparatus  
for introducing..... G. Dentsch  
Steel. Manufacturing 6 pats..... W. B. Brookfield  
Still..... A. L. de Lautreppe  
Stirrup..... A. Kliebsch  
Stirrup..... W. L. Ward  
Stirrup spur attachment..... C. L. Poortet  
Stoker. Self acting mechanical..... H. Untiedt  
Stone, &c. Making artificial..... E. K. Sutcliffe  
Store goods. Tool for reaching..... F. H. Bertschy  
Stone sawing machine. High speed gang.....  
..... R. F. McKinley  
Stove grate..... R. J. Lore  
Stove. Heating..... C. E. Hill  
Superheater..... 2 pats..... J. R. Brown  
Superheater tube..... E. H. Foster  
Surgical chair..... W. I. St. John  
Suspender attachment..... J. P. Muth  
Switch operating mechanism. Automatic.....  
..... H. T. Dumas  
Switch turning device..... L. L. Bigelow  
Syringe. Fountain..... O. Wider  
Tablet. Writing..... H. V. Lough  
Tack driver..... S. Beauregard  
Tally device..... L. L. Frost  
Tanning and tawing compound..... G. Smith  
Tapping device. Liquid..... T. Tietz  
Tea or coffee pot..... H. W. Gauder  
Telgraph apparatus. Electric printing.....  
..... H. Casevitz  
Telegraph system. Automatic printing.....  
..... L. Casper  
Telegraphic code..... C. G. Burke  
Telegraphic instrument. Miniature..... B. I. Levi  
Telephone cut out..... W. L. Ralston  
Telephone hygienic appliance..... H. L. Cutter  
Telephone system. Private..... T. J. Seely et al  
Thermometer..... H. Frankenberg  
Thill coupling..... R. Eccles  
Thread protector..... G. W. La Voo  
Thrashing machine bodies. Device for shift-  
ing..... G. Graham  
Thrashing machine feeder attachment.....  
..... E. U. Down  
Tile strip breaking apparatus..... P. Semmer  
Tile strips. Breaking..... P. Semmer  
Tiles. Box for making angular..... M. Koudolf  
Time recorder..... S. A. Dean  
Timepiece winding indicator..... W. A. Aumen  
Tin scraps. Machine for cutting up.....  
..... M. Lemberg  
Tire construction..... C. E. W. Woodward  
Tire. Pneumatic..... 2 pats..... I. Tennant  
Tire. Vehicle..... 2 pats..... C. A. Pettie  
Tire. Vehicle..... R. M. Connally  
Tire. Vehicle wheel..... G. Lagache  
Tires. Making single tube pneumatic.....  
..... T. R. Palmer  
Toilet case. Combination..... J. Q. A. Cate  
Tool..... J. Peelle  
Tool..... C. A. Ergo  
Top..... G. Wilken  
Top roller spring holder..... A. A. Sack  
Top spinner. Self winding..... R. J. Wilson  
Toy. Pneumatic..... G. Schneider  
Trace carrier..... A. A. Breast  
Tramways. Bucket grip for rope.....  
..... R. N. Riblet  
Treadle mechanism..... R. S. Fleming  
Trisodium phosphate. Manufacturing.....  
..... E. H. Strickler  
Trolley guide..... M. Walker  
Trolley head..... J. Bishop  
Trolley track switch. Overhead.....  
..... C. G. Schmidt et al  
Truck bolster. Railway car..... S. Otis  
Truck. Railway car..... S. Otis  
Trunk..... W. R. Worth  
Trunk lock..... G. Goerk  
Type bar hanger..... C. Spiro  
Type casting and composing machines. Me-  
chanical controller for automatic..... J. Pinel

Type writer carriage paper guide..... C. Spiro  
Type writer carriage retarding device.....  
..... A. W. Steiger  
Type writer shift key..... C. Spiro  
Umbrella..... W. A. Schonfeld et al  
Umbrella. Folding..... M. B. Burgess  
Valve..... L. & J. S. Swenson  
Valve and door. Gate..... L. P. Lowe  
Valve. Bottle..... J. H. Dieringer et al  
Valve. Engine reversing..... R. S. Furman  
Valve gear..... F. W. Jarvis  
Valve. Relief..... W. D. Wood  
Valve. Rotary engine steam controlling.....  
..... C. D. Fenelon et al  
Varnish. Manufacturing oil..... W. Traine  
Varnishes. Manufacturing..... W. T. Scheele  
Vehicle draft connection..... W. M. Ricketts  
Vehicle driving mechanism..... P. Synnestvedt  
Vehicle spring..... C. L. Thomas  
Vending apparatus..... G. W. MacKenzie  
Vending machine..... E. S. Scheble  
Vending machine. Coin controller..... F. J. Rowe  
Vending machine for newspapers, magazines,  
&c. Coin controlled..... C. H. Baisley  
Vessels. Apparatus for increasing speed of.....  
..... J. K. Ross et al  
Vulcanizer..... H. C. Frost et al  
Walking beams and samson posts. Center iron  
for..... L. C. Sands, Jr  
Wall construction. Building..... M. Garvey  
Walls. Construction of..... A. Lugino  
Warp let off motion..... W. W. Uhlinger  
Warping reel..... 2 pats..... R. J. Chowen et al  
Washing device. Steam..... M. Glass  
Watch guard..... W. F. Martin  
Water closet flushing tank..... E. G. Watrous  
Water elevator..... J. L. Brown  
Water purification apparatus..... F. S. Hammond  
Water. Separating oily or similar impurities  
from..... H. T. Davis et al  
Weaving initials, names, monograms, &c.....  
..... J. Lucas et al  
Weighing machine..... L. Hachenberg  
Weighing machine..... M. L. Smail  
Weighing machine. Automatic..... C. T. Brown  
Weight supporting device..... G. F. Bush  
Whip..... H. Polak  
Whist case. Duplicate..... A. L. Beard  
Wind motor..... A. Gran  
Winder. Bobbin..... W. J. Milne  
Window bead lock..... I. A. Brown  
Wire cover..... H. C. Boyle et al  
Wrench..... J. H. Shepherd  
Wrench..... J. H. Adams  
Wrench..... C. D. Dutcher  
Yoke. Animal..... J. J. Ingram

## DESIGNS.

Chain or similar article. Fob..... G. E. Homer  
Display fixture for stores..... 4 pats..... H. G. Roth  
Gem setting..... G. T. Wittstein  
Glass. Plate..... 2 pats..... T. J. Woodward  
Hair ornament..... 2 pats..... C. H. Howe  
Mirrors, brushes, or similar articles. Back for  
..... W. Turton  
Spoons, forks, or similar articles. Handle for  
..... E. Crees et al  
Vase. Wall..... E. Elliott

**FREE!**

Send us 2 cents to pay for postage and we will mail you a valuable copyrighted book, "How to obtain Patent, Caveat, Trade-Mark and Copyright Protection, with Decisions in Leading Patent Cases" entirely free of charge. Address:

INVENTIVE AGE PUBLISHING COMPANY,  
(Dept. P.) WASHINGTON, D. C.

## Drawings for Inventors.

If you want copies of the drawings of your patent, we can procure them at these prices:

12 copies, each sheet full size (8x13)	\$ 2.50
25 " " " " " "	3.50
50 " " " " " "	4.50
100 " " " " " "	7.00
500 " " " " " "	13.00
1,000 " " " " " "	17.00

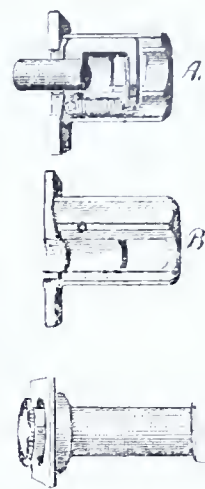
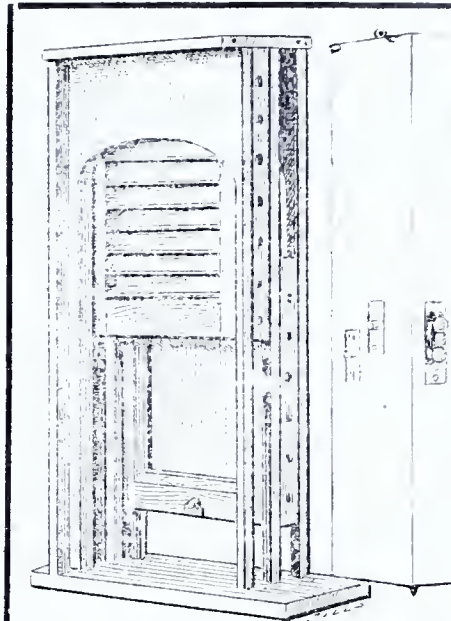
12 copies, each sheet reduced 1/3 (8 2/3 x 11 1/3)	\$1.25
25 " " " " " "	2.00
50 " " " " " "	3.00
100 " " " " " "	4.00
500 " " " " " "	7.50
1,000 " " " " " "	9.00

These copies will be made by the photo-lithographic process, by the same firm which photo-lithographs the Patent Office work, and will be equally as good as the drawings accompanying your letters patent. Five hundred copies of your patent would cost you at least \$25. We can furnish 500 copies of the drawings, if contained on one sheet, for \$13 full size, or \$7.50, if reduced one-third, the same reduction as your letters patent drawings. Your valued orders solicited.

The Inventive Age Publishing Company,

WASHINGTON, D. C.

## Valuable Patent for Sale.



# MILLER'S IDEAL SASH LOCK.

Unequaled for  
Simplicity  
and  
Durability.

Patented April 15, 1903.

Patented in the United States, France and Great Britain.

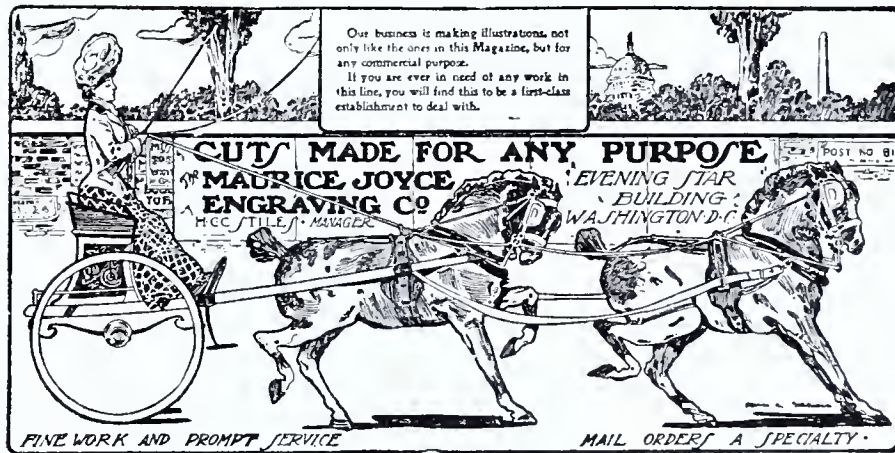
The above illustration shows the lock when applied to window of the car, with the casing removed showing the manner of fastening the sash and blind, which is done by making small insertions in the side of the blind or sash, as shown in the above cut. By merely pressing a button, as in ringing a door bell, causes the bolt to slide back, thus relieving the sash, which can be moved up or down to any distance required.

Should it be found more convenient, the lock can be mortised in the sash, letting the bolt fasten in the casing just *vice versa* from the frame, there being nothing visible on the sash except the button.

The small pieces on the right of the cut show the lock with the lid removed, illustrating the inside or mechanical parts of the lock, which consist of only three small pieces: one bolt, one small spring and one key or push bolt. The entire lock weighs less than two ounces.

The lock is not only adapted for car windows, but can be applied to any dwelling house window. Address for further particulars,

JOHN D. MILLER,  
No. 137 South Flores St.  
San Antonio, Texas.



## RIDER AGENTS WANTED

in each town to take orders for our new High Grade Guaranteed Bicycles.

### New 1903 Models

"Bellise,"	Complete	\$8.75
"Cossack,"	Guaranteed High Grade	\$10.75
"Siberian,"	A Beauty	\$12.75
"Neudorf,"	Road Racer	\$14.75

no better bicycle at any price.

Any other make or model you want at one-third usual price. Choice of any standard tires and best equipment on all our bicycles. Strongest guarantee.

We SHIP ON APPROVAL C. O. D. to any one without a cent deposit and allow 10 DAYS FREE TRIAL before purchase is binding.

500 Second Hand Wheels \$3 to \$8 taken in trade by our Chicago retail stores, all makes and models, good as new.

DO NOT BUY a bicycle until you have written for our FACTORY PRICES AND FREE TRIAL OFFER. Tires, equipment, sundries and sporting goods of all kinds, at half regular price, in our big free sundry catalog. Contains a world of useful information. Write for it.

J. L. MEAD CYCLE CO., Chicago, Ill.



# A Useful Christmas Present.

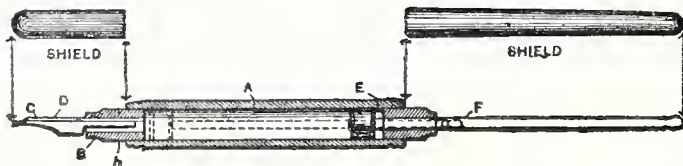


## The "POST" SELF FILLING FOUNTAIN PEN.

No Filler. No Soiled Fingers. No Lost Time. Simple and Perfect.

### THIS IS ITS CONSTRUCTION

IT IS AWAY AHEAD OF ANY OTHER PEN MANUFACTURED BECAUSE OF ITS SELF-FILLING AND SELF-CLEANING FEATURES.



BEING THE ONLY ONE MANUFACTURED HAVING THESE CONVENIENCES.

We will send this famous pen, postpaid, and one years subscription to "The Inventive Age," for \$2.00.

Every Inventor in the country needs The Inventive Age, and everyone needs a pen. Here's your chance to get a bargain.

There are many pens on the market, some have been sold for years and are very popular, but we venture to say that all the pens manufactured together have not such a list of recommendations as the "Post" has secured. We have testimonials that a million dollars could not buy. In the list will be found leading men in politics, finance, law, religious movements, literary men, bankers and business men. Men who have never before allowed their names to be used in this way have not hesitated to recommend the "Post" and in terms of praise simply unqualified. Send for list of testimonials.

Address: **THE INVENTIVE AGE Publishing Co.**

918 F St. Northwest,  
Washington, D. C.

### Our Great Popular Offer!

...A...

## Complete Electrical Library

By PROF. T. O'CONOR SLOANE.

...A...

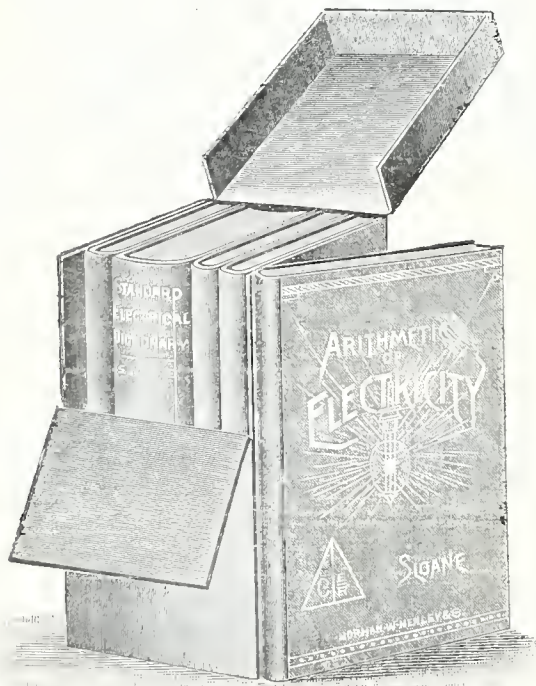
\$7.00

Library

for

\$5.50.

Comprised by  
the following  
books:



5 Volumes,

1300 Pages,

Over 450

Illustrations.

Electricity Simplified.....	Price 1.00	Our Great Special Offer.—We will send prepaid, the above five volumes, handsomely bound in blue cloth, with silver lettering, and enclosed in a neat folding box, as shown in the illustration, at the Special Reduced Price of \$5.50 for the complete set. The regular price of the five volumes is \$7.00
Arithmetic of Electricity.....	1.00	
Electric Toy Making.....	1.00	
How to Become a Successful Electrician.....	1.00	
The Standard Electrical Dict'y	3.00	

Order direct from us while the opportunity lasts. Any of the above books sold singly at the published prices. You save \$1.50 by ordering the complete set from us. Sent prepaid on receipt of price. Remit by draft, postal money order, or express order.

Address: **THE INVENTIVE AGE Pub. Co.,** 918 F Street, N. W., Washington, D. C.

## MECHANICAL - - - - MOVEMENTS, Powers, Devices and Appliances:

By Gardner T. Hiscox, M. E. Price \$3.00.  
Author of "Gas, Gasoline and Oil Engines."

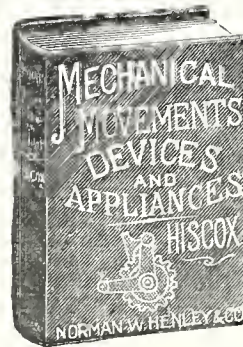
Large 8vo.

Over 400

Pages

Handsomely

Bound in Cloth.



1,649 Specially  
Made  
Illustrations  
With Descrip-  
tive Text.

PRICE, \$3.00

A **DICTIONARY** of Mechanical Movements, Powers, Devices, and Appliances, embracing an illustrated description of the greatest variety of mechanical movements and devices in any language. A new work on illustrated mechanics, mechanical movements, devices, and appliances, covering nearly the whole range of the practical and inventive field, for the use of Machinists, Mechanics, Inventors, Engineers, Draughtsmen, Students, and all others interested in any way in the devising and operation of mechanical works of any kind.

Sent to any address on receipt of price.

Address: **INVENTIVE AGE Pub. Co.,** 918 F. St., N. W., WASHINGTON, D. C.















